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In this Issue—

Advances in Tuned R. F. Receiver Design

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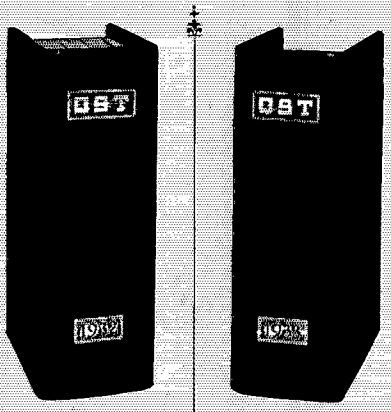
for

Two Kinds of *QST* People

1932
Binders
for
procrastinators



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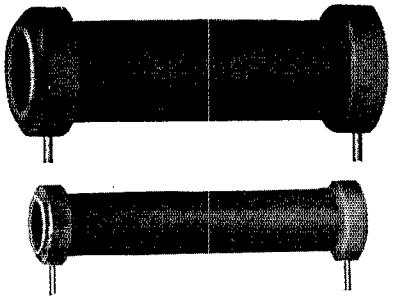
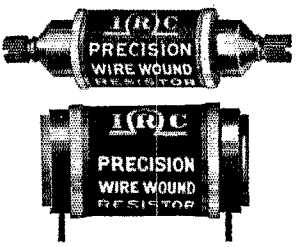


POWER WIRE WOUND

MOTOR RADIO SUPPRESSORS



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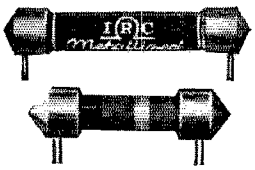

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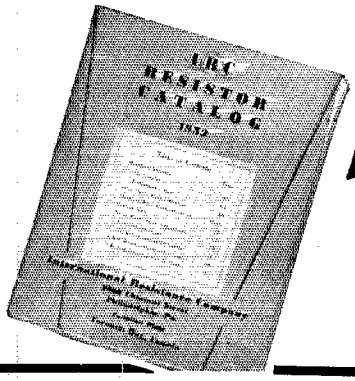

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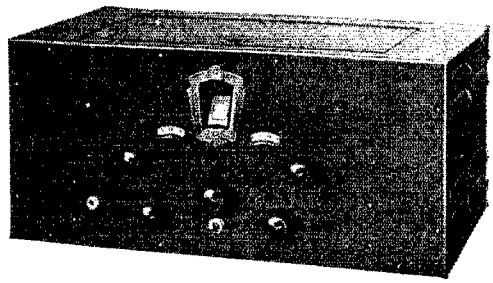

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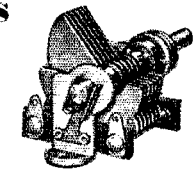

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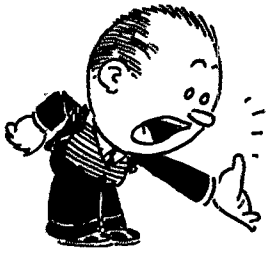

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JANUARY
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VOLUME XVII
NUMBER 1

Kenneth B. Warner (Secretary, A.R.R.L.), *Editor-in-Chief and Business Manager*; Ross A. Hull, *Acting Editor*; James J. Lamb, *Technical Editor*; George Grammer, *Assistant Technical Editor*; Clark C. Rodimon, *Managing Editor*; David H. Houghton, *Circulation Manager*; F. Cheyney Beekley, *Advertising Manager*; Ursula M. Chamberlain, *Assistant Advertising Manager*.

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THE Amateur's Bookshelf

GOOD TEXTBOOKS and operating manuals should be on every amateur's bookshelf. We have reviewed practically all the books in which the amateur would be interested, and have arranged to handle through the *QST* Book Department at A.R.R.L. Headquarters those volumes which we believe to be the best of their kind. Take pride in a small but good radio library; buy a few good books and get into the habit of reading them.

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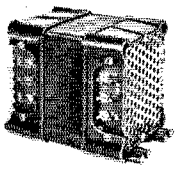
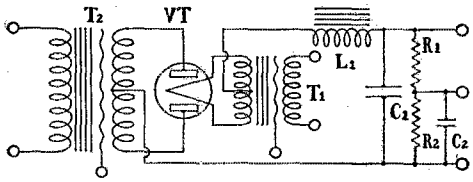


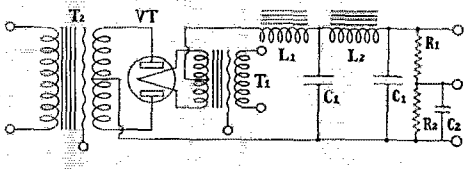
TYPE A

RECTIFIER CIRCUIT INFORMATION

Rectified A.C. power supplies must **1st DELIVER SUBSTANTIALLY CONSTANT VOLTAGE.** This requires good transformer regulation and a low-resistance swinging choke of proper inductance range. **2nd** they must **ADEQUATELY SMOOTH THE RIPPLE.** Acme-Delta engineering provides filters reducing the ripple to low values obtained in best commercial practice. When using accurately rated Acme-Delta parts, filter circuits can be and are designed for predetermined characteristics. **3rd** they must **PROPERLY OPERATE THE RECTIFIER.** The swing choke originated by Delta prevents high current peaks, contributes materially to smoothing and improves regulation, thus combining three important features. The variation of inductance **must** be correct. **4th** they must **PREVENT OUTSIDE INTERFERENCE.** Metallic shields described below accomplish this.



CIRCUIT "A" (CW ONLY)



CIRCUIT "B" (CW OR PHONE)

Group	For Operating	Rect. Tubes	D.C. Volts	D.C. Amps.	Res. Ohms Bleeder	Catalog Numbers T1	T2	L1	C1	L2	Ripple (Note 4) Circ. A	Circ. B	Regulation Circ. A	Circ. B
I	1-47+ 3-46	1-82	400	.175	25,000	AD10	AD20	AD30	AD51	AD40	5%	0.25%	13%	18%
II	4-'10	2-'66	750 or 500	.200	40,000	AD11	AD21	AD31	AD51	AD41	3%	0.12%	8-9%	11-13%
III	2-'03A or 2-'11	2-'66	1250 or 1000	.500	25,000	AD12	AD22	AD32	AD51	AD42	5%	0.25%	7-8%	10-11%
IV	2-'52 or 1-'04A	2-'66	2500 or 2000	.250	100,000	AD15	AD22	AD32	AD52	AD42	2.5%	0.07%	6-7%	7-9%

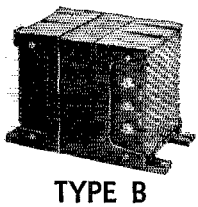
Note 1. Circuit "B" is made by adding L2 and C1 to Circuit "A" and moving bleeder to termination. Value of bleeder given in tables is sum of R1+R2 and value of R1 is determined by tap-voltage and current. C2 value to suit tap-voltage and R.F. or A.F.

Note 2. Filament transformers have multi-windings for both rectifier and transmitter tubes. For rectifiers only use AD15, or AD17.

Note 3. Transformer AD22 and chokes AD32 and AD42 are convenient and economical. Transformer output and choke inductance may be changed to suit either group III or IV by moving the convenient Link-terminals (illustrated). An initial '03A set-up may be changed to '04A or '52 easily without additional expense.

Note 4. Ripple and regulation values are given when recommended apparatus is used throughout the circuit.

TRANSFORMERS



TYPE B

Acme-Delta transformers are designed and constructed with the same care and attention as the units described in Delta Bulletin 200A.

All units are assembled with static shields between primary and secondary to minimize "tunable hum," key-click interference, and R.F. radiation from lighting lines.

They will deliver their rated voltage within limits of minus 0 plus 5%. This is important in filament excitation to obtain maximum tube life.

They will operate continuously at full load without the temperature rise exceeding 50° C. This gives long life and the ability to stand large temporary overloads.

Their mountings are simple to reduce cost, but due to careful design are nevertheless attractive and adequate. All terminals are non-rotating type mounted on engraved bakelite panels.

Separate transformers are provided for plate and *filament excitation. This permits leaving filaments on* while receiving to facilitate quick changeover. Every unit before shipment is carefully tested for insulation, shorted turns, and voltage output.

ACME-DELTA PLATE TRANSFORMERS

Standard Primary Input — 115 Volts — 60 Cycles, 1 Phase

Cat. No.	Type	D.C. from Filter Volts	D.C. from Filter Amps.	A.C. from Secondary Volts	A.C. from Secondary R.M.S. Amps.	Output Power VA	Output Sec. VA	Insulation	Wgt. lbs.	Price
AD20	A	400	.175	480-0-480	.130	95	125	2,500	6¾	$5.05
AD21	B	750 or 500	.200	900-600-0-600-900	.150	200	270	4,000	11¼	7.60
AD22		*1000 or 1250	.500	1500-0-1500 max.	.380					
Note 3	C	2000 or 2500	.250	3000-0-3000 max.	.190	845	1140	8,500	29	17.25

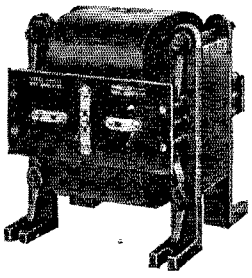
NEW ACME-DELTA

TRANSFORMERS .. SWINGING-CHOKES .. SMOOTHING-CHOKES .. PYRANOL CONDENSERS

ACME-DELTA FILAMENT TRANSFORMERS

Standard Primary Input — 115 Volts — 60 Cycles — 1 Phase

Cat. No.	Type	Tubes	Output Volts	Output Amps.	Insulation	VA	Wgt. lbs.	Price
AD-10	A	(Note 5.) '82 '27, '45, '46, '47	2.5 C.T. 2.5 C.T. 2.5 C.T.	3.0 3.5 3.5	2,500	25	2¾	$2.85
AD-11	A	'66 '10, '41, '42) '50, '65, '81)	2.5 C.T. 7.5 C.T. 7.5 C.T.	10.0 2.5 2.5	3,500 2,500 2,500	62	5½	5.50
AD-12	B	'66 '03A, '11, '17C) '52, '60)	2.5 C.T. 10.0 C.T. 10.0 C.T.	10.0 3.25 3.25	8,500 2,500 2,500	90	8¼	6.00
AD-13	B	3-'04A or W.E.	10, 11, or 14 C.T.	12.5	2,500	175	10	8.85
AD-14	B	Federal F-100A	10, 11, or 14 C.T.	25.0	2,500	350	16	13.20
AD-15	A	2-866 or equal	2.5 C.T.	10.0	7,500	25	2¾	2.75
AD-16	B		5.0 C.T.	20.0	7,500	100	8¼	5.75
AD-17	A	2-872 or equal '82 or '83	5.0 or 2.5 C.T.	3.0	2,500	15	2¾	2.30



TYPE C

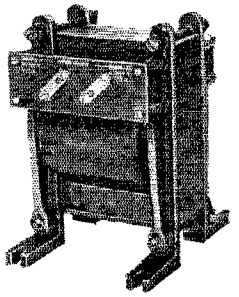
Note 5. Also made for 83 Rectifier, type AD18, Price **$3.00**

ACME-DELTA SWINGING CHOKES

The first filter choke should swing with load between definite inductance limits.* Acme-Delta swinging chokes will operate at **lower voltage** than listed, but should not be used for **higher voltage** without special recommendation.

*See Bull. 200A, Page 12.

Cat. No.	Fig.	Inductance Henrys	Max. D.C. Current	Max. D.C. Volts	Min. Input Condenser M.F.	Resis. Ohms	Insulation	Wgt. lbs.	Price
AD30	A	5/25	.175	400	3	135	2,500	6	$4.55
AD31	B	8/40	.200	750	2	110	2,500	11	6.00
AD32 (parallel)	E	5/25	.500	1,250	3	70	6,000	17¾	11.25
AD32 (series)	"	20/100	.250	2,500	1	275	"	"	"

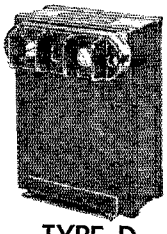


TYPE E

ACME-DELTA SMOOTHING CHOKES

Delta test methods give the **actual** inductance as obtained in filter circuits.* Most commercial choke ratings are obtained by tests not comparable to operating values. Both rating values are listed herein. *Bull. 200A, Page 14.

Cat. No.	Fig.	Inductance Smoothing Rating	Inductance Commercial Rating	Max. D.C. Current Amps.	Resis. Ohms	Energy Storage Watt-Secs.	Insulation	Wgt. lbs.	Price
AD40	A	8.5	13	.175	135	0.26	2,500	6	$4.55
AD41	B	10.0	16	.200	110	0.48	2,500	11	6.00
AD42 (Coils parallel)	E	8	10	.500	70	2.00	6,000	17¾	11.25
AD42 (Coils series)	"	30	40	.250	275	"	"	"	"



TYPE D

PYRANOL FILTER CONDENSERS

American manufacture. Used by Delta in all its commercial heavy-duty broadcast equipment.

Cat. No.	Cap. Mfd.	R.A.C. Voltage	Price
AD50	2	1,250	$5.80
AD51	4	1,250	6.50
AD52	2	2,500	11.50

All are type D

COUPLING TRANSFORMERS CLASS "B"

Cat. No. AD70 Type A, Class "B" Input Transformer. For coupling '45, '50 or '46 to '03A, '11 or W.E. 242 **$4.90**

Cat. No. AD71 Type E, Class "B" Output Transformer. For coupling '03A, '11 or '42 to Class "C" 1000 v., 0.4 amps. max. or 2000 v., 0.2 amps. max. **$15.40**

Circuit diagram, information and operating characteristics are contained in Bulletin AD-1. Send for your copy.

NEW LINE-VOLTAGE CORRECTING TRANSFORMERS

Acme-Delta auto transformers compensate for variation in line voltage by six steps between 100 and 125 volts. Moving a single link changes all transformers simultaneously.

Cat. No. AD80. Input 100-125 v. (6 steps). Max. output 115 v. 5 amp. VA-575, Wgt. 8¾ lbs. **$6.10**

Cat. No. AD81. Input 100-125 v. (6 steps). Max. output 115 v. 10 amp. VA-1150, Wgt. 13¾ lbs. **$8.10**

ENGINEERING SERVICE

If the standard items listed herein do not meet your requirements, we will be pleased promptly to quote on custom-built Acme-Delta apparatus.

GUARANTEE. The goods listed on these pages are guaranteed to be free from defect in materials or workmanship. If unsatisfactory, they can be returned to us within 15 days from date of delivery, without question. Furthermore, under normal use and service, if found defective within **5 years** of delivery date we will repair said goods without charge or replace defective parts, f.o.b. our factory at Cambridge, Mass., providing original parts are returned to us, transportation charges prepaid.

TERMS OF SALE. 20% of purchase price with order, balance C.O.D., unless approved credit. Money order, express check, certified check. For established credit, net 30 days. Because of Delta quality and engineering service and direct sale to user, terms are **without any discount;** strictly F.O.B. common-carrier.

F. S. Dellenbaugh, Jr., Pres. & Chief Engr. — G. E. M. Bertram, Treas. & Gen. Mgr.

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is non-commercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the world and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite. Correspondence should be addressed to the Secretary.

A directory of the amateur societies affiliated with the League, showing their times and places of meetings, is available upon request.

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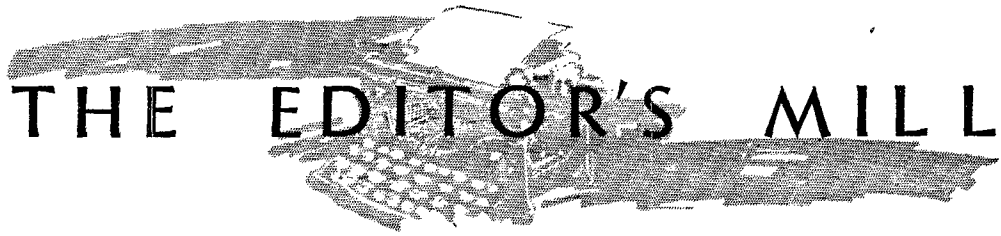


"There has been an unprecedented increase in the users of amateur radio during the past year. Last year (1931) there were 22,739 licensed amateur transmitting stations. This year there are 30,374, an increase of 7635."

— Annual Report of the Director of the Radio Division for the year ending June, 1932.

THE above excerpt from the annual report of Mr. W. D. Terrell will be of the keenest interest to every follower of amateur radio. For the third successive year amateur radio in the United States registers a big increase over the previous year. Thirty thousand of us — and still going strong!

Back in the fall of 1928 there was much viewing with alarm of the dawn of 1929 and the beginning of the era of reduced operating territory on "20" and "40" as a result of the Washington radio conference. Many were the gloomy predictions at that time as to the future of our hobby. Amateur radio, so the pessimists informed us, was headed for the skids; the following years would see a steady decline in the number of licensed operators. The terrific interference conditions, supposedly inevitable under the new conditions, would drive hams by the dozen out of amateur radio into collecting butterflies instead of QSL cards, and dancing instead of DX on Saturday nights.

!!MADRID FLASH!!

As this issue goes to press, word reaches us that the Madrid international radio conference is over! On December 9 the United States and other delegations signed the document which, subject to final ratification by the signatory powers, guarantees to amateur radio continuation of every one of the frequency bands and general regulations under which we have operated for the past four years. On the same day Secretary Warner sailed from Europe for this country. We'll be glad to have him home again and hope that in the next issue we can present his own story of the three-months' conference and of the splendid battle that he and General Counsel Segal waged in behalf of our interests — a fight that resulted in a 100% success from the amateur standpoint.

— A. L. B.

What actually happened was that right from the start we began to chalk up the biggest yearly increases in numbers in our history! At the beginning of 1929 there were approximately 16,000 licensed amateurs in this country. To start the ball rolling there was an increase of 2165 during that year, and the figure has been jumped up in increasingly large jumps ever since until now we have the total announced by Mr. Terrell — almost twice as many amateurs as in 1929!

So much for dire prophecy.

Now, on the face of it this great growth might appear to be somewhat detrimental to the satisfactory use of our art. Fourteen thousand new amateur stations — what a perfect bedlam of interference they should create. By all the signs, the old game should be heading steadily for the demnition bow-wows in a glorious oblivion of uselessness. And yet we all know that isn't so. Amateur operation today, to those who keep up with the times in technique and in apparatus, is even more satisfactory than it was three years ago. Interference there is, to be sure, but nowhere near as much as would normally be expected as a result of doubling the number of stations on the air; QSO's are in many ways easier and more satisfactory.

The secret of keeping interference at a standstill while the number of stations doubled can be explained in a word — technical development has kept pace with the growth in amateur radio. New receivers, new conceptions of frequency calibration and control, diversified activity on five bands instead of three and new technique in station operation have kept the old interest and verve in the game alive. Let's consider some of these factors. Receiver progress has made tremendous strides since 1929, with nearly every amateur receiver now either a superhet — and more and more of them becoming single-signal — or having a good, sharp stage of tuned r.f. True, a ham today getting on the air with a 1929 receiver will get more interference than he did at that time. It is necessary to grow with the game. A 1929 car, a 1929 broadcast receiver are equally unsatisfactory in the light of 1933 requirements.

Crystal control, stabilized oscillators, electron-coupled oscillators and frequency meters, our standard-frequency system, combine with many other things to produce the extreme frequency-consciousness of amateur radio's fourth decade. Then, too, the old system of twirling a dial until the transmitter was presumably within a band and going to work has been rendered obsolescent by modern operating practices. We all know that most of the interference in our various bands comes in chunks; select a frequency between such

groups of clustered stations as there are on the dial and the problem disappears — unless another cluster forms around you. But a couple of different crystals, or the use of good MOPA's, preferably with electron-coupled oscillators, minimizes even this problematic difficulty.

The last but by no means least important factor in our present conditions has been the diversification of amateur activity throughout five bands in contrast with the concentrated three-band activity of 1929. Perhaps we're being kind to credit 1929 with even three-band activity; the big crush then was on "40," with "80" taking most of the remainder and "20" getting only a small share of attention. Now our active stations are distributed much more equably between the 7000-kc. and 3500-kc. bands, with about the same number still on 14,000 kc. and thousands of stations working on 56 mc. and 1715 kc. where there were practically no stations at all three years ago. The increasing trend of activity into these last-mentioned two bands has been one of the most significant developments of the last year or two and is making amateur activity even more satisfying and intriguing.

No concern need be felt as to the future of amateur radio, or of our ability to handle new situations as they arise. We know we are still on the increase, so far as numbers go, and that the total today is some thousands greater than the figure given in Mr. Terrell's annual report. These new thousands of amateurs, and the thousands to be added to them in the years to come, will create new problems in apparatus and technique, problems that will have to be faced and licked if we are to continue a happy existence. But we'll lick 'em! Our record of past performance guarantees that. — A. L. B.

Another Storm Weathered

ANOTHER International Radio Conference has come and gone and Amateur Radio remains unchanged. Secretary Warner, assisted by General Counsel Paul Segal, so handled our affairs at Madrid that every one of our amateur bands has been preserved, as well as our other rights and privileges. In short, "Madrid" is over and Amateur Radio is still the same old Amateur Radio.

The average amateur who pounds his brass and leaves the rest to A.R.R.L. may not appreciate what this means. But the directors and officers appreciate what it means. For two long years they have studied and planned, wondering if the decisions they made were wise ones or not, dreading some kind of misstep that would shatter our hopes. To know that we have come through with all our privileges intact is an immense relief. We know now that we planned well and decided wisely, and that the men selected to fight our battles before an unsympathetic world were well selected. It was no easy job we handed Warner and Segal. Their brilliant victory was achieved only by hard fighting and skillful maneuvering. They deserve our heartiest congratulations and thanks.

Hiram Percy Maxim

President, American Radio Relay League

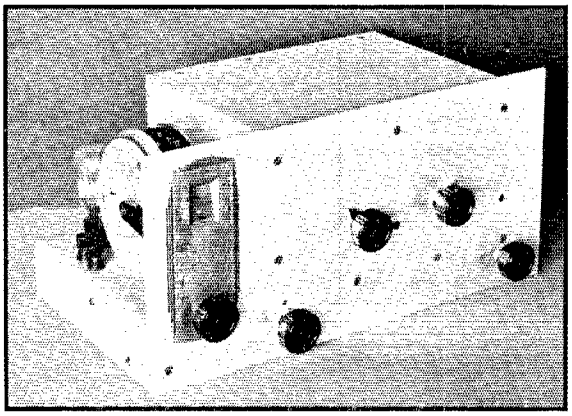
Rationalizing the Autodyne

A Three-Tube Regenerative Receiver of Unusual Performance

By George Grammer, Assistant Technical Editor

THE development of the autodyne receiver for c.w. reception has been a continuous battle for sensitivity and more sensitivity. From the days when a low-loss detector and one-step was the last word in ham receivers to the present era of screen-grid r.f. amplifiers and screen-grid detectors the chief object has been to build sets which would give more noise output for the least signal microvolt input. The latest contribution is the new 56–57–58 series of tubes, which undoubtedly have it "all over" their predecessors.

In the meantime some other rather desirable characteristics that receivers should possess seem to have been lost in the shuffle. To be sure, amateurs who have built new receivers whose operation has delighted them, occasionally put forth a few half-hearted claims about "selectivity" — not particularly because the receiver is really more selective but because it's the conventional thing to do. The fact of the matter is that in the set which has become the standard amateur receiver — one r.f., regenerative detector, and one audio — sensitivity and effective selectivity just don't go hand in hand. When you get one you don't get the other, and vice versa. Since both are desirable, it ought to be possible to select whichever of the two is needed under any particular conditions. Then our autodyne receivers would be in a position to give us some real service.



FIVE KNOBS BUT SINGLE-CONTROL TUNING

Band-setting condensers account for the two upper knobs. The others are the tuning, regeneration control and gain. This set is not particularly compact, having been made big enough to sit still on the operating table when being tuned.

WHERE R.F. AMPLIFIERS FAIL

Superficially it might seem that unlimited sensitivity would be the height of desirability but, as in all things, there is a limit. That limit is the noise or background level. If a signal is down below that level no amount of amplification in the world will bring it up to readability. This noise level, it should be understood, is not only noise picked up on the antenna, which may at times be very low, but also includes tube noise. Almost any tuned r.f. receiver will give out a hiss that can be heard a couple of feet from the phones with the detector oscillating even if the set is completely shielded and the antenna is disconnected. A lot of it comes from the r.f. stage, as taking out the r.f. tube will show. Our old receivers didn't do that, but the same noise was there, nevertheless. We hear the signals a lot louder to-day, but it is questionable whether we hear any *weaker* ones than we used to. The old receivers used to get down to the background level, too.

This is not an argument against using r.f. amplifiers nor against high sensitivity, but an r.f. amplifier may not be all beer and skittles. It happens that a regenerative detector is at its best when the incoming signal is weak; that is, the sensitivity decreases rapidly as the signal becomes stronger. R.f. amplifiers therefore don't give the increase in signal strength that might be expected, because the detector sensitivity goes down as the r.f. gain goes up. This would be distinctly favorable were it not for the fact that the detector can't work right on both weak and strong signals. If the circuits are adjusted so that the detector is highly sensitive to weak signals it will be highly unsatisfactory on the strong ones, and vice versa. The unsatisfactoriness arises from the fact that an oscillating detector adjusted for maximum sensitivity will be "pulled in" by a moderately strong signal — that is, the frequency of oscillation tends to become the same as that of the signal — and it is, therefore, difficult to heterodyne the incoming signal to get a beat note.

Strong signals, instead of becoming loud in proportion to their strength, simply spatter out over several divisions on the tuning dial and are often harder to copy than weak ones. Worse still, in the course of spattering they wash out any weaker signals in their immediate vicinity. Thus the strange result that a tuned r.f. stage, simply because it brings practically all signals up to good strength, may *decrease* the effective selectivity of the receiver in spite of the fact that it is supposed to add to it.

SELECTIVITY

Now that the question of selectivity has been brought up, we really ought to get straight on just what we mean by the word. There are several kinds of it. Usually one thinks of r.f. selectivity as a measure of the ability of the receiver to separate two signals of about the same strength on adjacent frequencies. The difference in this respect between any two tuned r.f.-regenerative detector receivers of the same general type is rarely worth talking about. It depends upon factors not readily overcome in this type of receiver, as James Lamb has pointed out in a previous article.[1] We can wipe this kind of selectivity out of the present discussion — it takes a "Single-Signal" receiver to get enough of it to be worth while.

But there are other types of selectivity that can and should be obtained in the autodyne receiver. One of these is freedom from interference from local stations working on frequencies somewhat removed from that of the desired signal. This includes interference from local broadcasting stations. If you have a ham neighbor a few blocks away you should be able to copy signals within at least 20 or 30 kc. of his frequency. But very few autodyne receivers we have seen will do it. Local stations usually cut a large swath out of the band and their key clicks can be heard over most of the rest of it, whether the receiver has a tuned r.f. stage or not. As for local broadcasting stations, either you hear them or you don't. If you do, there is no need for us to point out that that type of interference is, to put it mildly, annoying.

A second type of selectivity is that which prevents the receiver from causing interference to itself. Queer words, but true. If you get loud harmonics from nearby ham stations or local broadcast stations, make sure that they aren't being generated in your own receiver before telling the other party his transmitter needs some things done to it. A straight autodyne detector coupled to the antenna, and especially a receiver with an untuned r.f. stage, may bring in lots of signals that actually don't exist. A strong local signal will overload the detector or untuned r.f. stage, which then will work as a frequency multiplier and generate harmonics of its own. It would seem that we already have enough legitimate interference without going to the trouble of manufacturing more of it.

Selectivity type number three has already been mentioned — the prevention of spreading of moderately strong signals (or so-called "blocking" of the detector) which not only makes them difficult to read but also wipes out weaker signals nearby. This is simply a case of too much signal at the detector. We have seen receivers in which this was so bad that the use of a good-sized antenna when listening on the 3500-kc. band at night was absolutely out of the question. All the signals blocked the detector to such an extent that not a single one of them could be copied.

All these things can and should be remedied in the 1933 autodyne receiver. If we can't get real "single-signal" performance from the regenerative set we can at least get the next best thing to it — elimination of practically all interference except that two-beat tuning peculiar to the autodyne detector. Once this is done audio selectivity will be of real help.

ELIMINATING AVOIDABLE INTERFERENCE

Harmonic generation in the receiver can be prevented or at least made negligible by utilizing the selectivity offered by a tuned r.f. stage. Since this type of interference occurs only when the interfering signal is on a frequency which is at the most half of that of the desired signals, a simple tuned circuit will be sufficient to keep out the fundamental frequency of the interfering transmitter. If a harmonic remains in spite of the tuned r.f. stage, then is the time to start blaming the transmitter.

The effectiveness of the tuned r.f. stage in cutting out interference from local broadcast stations and nearby amateurs is also unquestioned. Only on detector blocking do we have any quarrel with r.f. amplification. And even this can be overcome by the simplest means imaginable — providing the r.f. stage with a gain control so that a strong signal can be cut down to the point where the detector does not block. An audio volume control is helpless to do anything except keep the phones from rattling.

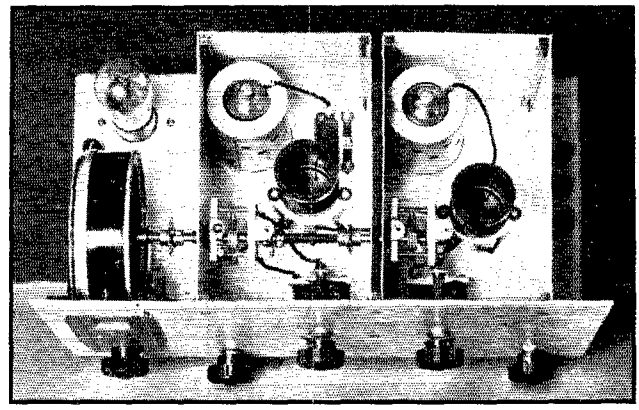
There are two obvious ways of controlling the r.f. gain of a receiver. One is by controlling the signal input, which does not actually change the gain but has an equivalent effect. When we cut down our receiving antennas we are really reducing the signal input, but an antenna of adjustable length would be a rather cumbersome affair. A method used for years in certain broadcast receivers was to connect a potentiometer between the antenna and ground and run the variable arm to the antenna coil on the first r.f. transformer. The potentiometer acts as a voltage divider and permits some regulation of the strength of the signal fed to the r.f. tube. This method, although easy enough to apply, has its disadvantages for ham-band receivers. In the

[1] "What's Wrong With Our C. W. Receivers," J. J. Lamb, *QST*, June, 1932.

first place, it brings the r.f. right out to the panel, and in the second place the r.f. tube is working its hardest even though the signal input is cut down. In other words, although the signal has been weakened, the r.f. tube is turning out just as much hiss as ever, making the signal-to-background ratio even more unfavorable than it is normally.

A better method is to vary the mutual conductance of the r.f. tube so that the actual amplification of the stage is decreased when the gain control is turned down. Then the tube noise will decrease in about the same ratio as the signal strength, leaving it possible to copy weak signals. The actual effect of this sort of gain control is to make an apparent improvement in the signal-background ratio, because to the ear it seems as though the noise decreases a great deal more than the signal does. The characteristics of variable-mu tubes are ideally suited to this type of control. It is only necessary to provide some means of varying the grid bias.

Simple though this may seem—and r.f. gain control really does prevent detector blocking and enormously increases the effective selectivity of the receiver—controlling the grid bias of the r.f. amplifier may cause detuning of the detector circuit if the receiver is not properly built. Inter-locking in tuning between r.f. and detector should be just about eliminated to get full benefit of r.f. gain control, because if there is regeneration in the r.f. stage the amount of it will depend on the mutual conductance of the tube. Furthermore, the detector should be a stable oscillator. These things mean good shielding and proper choice of circuit constants. Before we tried the thing we anticipated that the change in plate resistance of the r.f. tube with varying grid bias might be the cause of an unavoidable change in the tuning of the detector circuit, but experience has shown that detuning from this cause is not noticeable at high frequencies. If detuning exists it can be traced to remediable causes.



INSIDE THE SHIELDS

Detector at the left, r.f. amplifier at the right. The audio tube sits behind the drum dial in the rear left-hand corner of the chassis. This photo shows the method of ganging the midget tuning condensers.

DETECTOR STABILITY

Getting away from selectivity for the moment, we've had a pet peeve about regenerative detectors for a long time, especially regenerative detectors in a.c. operated receivers. Most of them are far from being stable-enough oscillators. The slightest change in plate voltage will cause the beat note on a received signal to wobble around, a thing which has driven a lot of amateurs to using "B" batteries for plate supply. And when an a.c. supply *is* used, the way crystal-controlled signals can develop wobbulation is something weird. Unfortunately no oscillator working right on the ragged edge of oscillation, as a regenerative detector does, can be wholly stable, but a lot can be done about it. And the most effective thing to do is a stunt we have been using for years in our transmitters — put some capacity in the tuned circuit. A detector circuit with the largest possible coil and the smallest possible condenser may give the greatest sensitivity, but then the frequency of oscillation is also extremely sensitive to small changes in plate voltage — to say nothing of its penchant for blocking or spreading out on any but weak signals. All the trick circuits we have tried, including the so-called separate regenerator tube, have failed to do a thing about this, but a little dose of our old friend high-*C* helps amazingly. Maybe there would be fewer plaints in our "Correspondence" columns about rotten signals if more of us had receivers that would do justice to the many really good ones on the air. Just as one example, a blindfolded observer would swear that most of the hams in America had decided to reform in the twinkling of an eye if he had a chance first to listen to the 40-meter band on the kind of regenerative receivers most of us have and then suddenly to be switched over to one with a really stable detector.

So far we have largely been talking generalities, but it should be evident by this time that in our opinion the 1933 autodyne c.w. receiver should have certain features. It should have a tuned r.f. stage, ganged with the detector circuit of course for each tuning; it should have an r.f. gain control to prevent detector blocking and increase the effective selectivity; and it should have a detector circuit which is as stable an oscillator as it is possible to make it. Its circuit diagram will look pretty much the same as that

of any other tuned-r.f. receiver. The real difference will be in its performance.

A PRACTICAL RECEIVER

These advantages have been incorporated insofar as possible into the receiver shown in the photographs. Although five controls have been brought out to the panel, the set is in reality a single-control-tuning affair. The two upper knobs (provided with pointers) are band-setting condensers; they are set when coils are changed and need not be touched after that. In the lower right-hand corner is the r.f. gain control. The regeneration control is diagonally below the tuning dial; it, too, need be set only once when coils are changed, since the detector will stay at the "just-oscillating" point over a whole band.

To get a fairly high-C circuit for the detector, the parallel-condenser method of band-spreading is used. This, as most of us know, consists of using a fairly large constant capacity in parallel with a small variable capacity. The degree of band spreading will depend upon the ratio of the two capacities and the size of the inductance used for a particular band. The circuit diagram is given in Fig. 1.

The panel is of $\frac{1}{8}$-inch aluminum and measures 7 by 14 inches. The sub-base is made of a single piece of $\frac{3}{32}$-inch aluminum with the corners cut out and edges bent down so that the top surface is 13½ inches by 7½ inches and the vertical sides are about two inches high overall. The sides were bent down with an ordinary small-size bench vise, first being scribed on the under side along the bending line and then worked down to position a little at a time. The two shield boxes are made of $\frac{1}{16}$th-inch aluminum, each measuring 4¾ inches high, 4¼ inches wide and 7 inches deep. The panel constitutes the front of both boxes. The pieces making up the sides of the boxes are fastened together by being screwed to vertical pieces of ¼-inch square brass rod which has been drilled and tapped to take small machine screws at appropriate points. Similar rods are also used for fastening the boxes to the panels. The lid fits over the tops of both boxes and is held in place by small pieces of phosphor-bronze spring strip which presses against the backs of the boxes when the lid is put on.

Although working in aluminum may look difficult to the ham with an ordinary cellar workshop, it requires more care and patience than it does skill. All the work on this receiver was done with nothing but a hack-saw, a bench vise, an ordinary hand drill, a file, a ten-cent kitchen knife, and a few taps.

The tuning condensers are 35-$\mu\mu$fd. Hammarlund midgets, mounted on the eft-hand side of each sh eld box as shown in the top-view photograph of the set. This type of condenser is readily adaptable to ganging because the shaft projects about a quarter-inch beyond the rear bearing. The condensers should be lined up carefully so the shafts and the center of the drum dial are on the same line, to avoid twisting when the dial is turned. To get a flexible coupling on the rear of the first condenser it is necessary to take off the small spring contacts that wipe on the shaft by

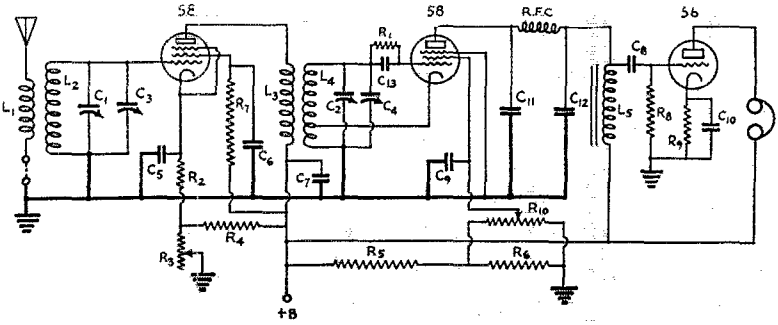


FIG. 1 — THE WIRING DIAGRAM

Heavy lines indicate grounds which should be made at one point. Heaters (not shown) are wired in parallel. Type 39 and 37 tubes may be substituted for the 58's and 56 shown with no change in the circuit diagram. Resistors R_4 and R_8 may be omitted if batteries are to be used as plate supply. See text.

COIL DATA

L_1, L_2 on same form; L_3, L_4 ditto.

Band	L_1	L_2	L_3	L_4	
1750	10	55	30	55	tapped at 3rd turn
3500	6	28	20	28	" " 1st "
7000	5	11	9	11	" " ½ "
14,000	3	5	5	5	" " ¼ "

C_{1-3} — 35-$\mu\mu$fd. midget condensers (Hammarlund Mc-35-S). See text.
C_{3-4} — 100-$\mu\mu$fd. midget condensers.
C_{5-8} — .01-μfd. mica condensers.
C_{9-10} — 1-μfd. non-inductive paper condensers.
C_{11-12} — 100-$\mu\mu$fd. fixed mica condensers.
C_{13} — 250-$\mu\mu$fd. mica condenser.
R_1 — 5 megohms.
R_2 — 250 ohms, 2 watt.
R_3 — 10,000-ohm wire-wound potentiometer, tapered (Yaxley).
R_4 — 50,000 ohms, 2 watt.
R_5 — 14,000 ohms, wire-wound, 5 watt.
R_6 — 5000 ohms, wire-wound, 5 watt.
R_7 — 100,000 ohms, 1 watt.
R_8 — 1 megohm.
R_9 — 2000 ohms, 1 watt.
R_{10} — 50,000-ohm potentiometer.

All primaries (L_1 and L_3) are wound with No. 36 d.s.c. wire. The 3500-kc. grid coils are wound with No. 20 d.c.c.; 1750-kc. grid coils with No. 28 d.c.c.; both close-wound. The 7000- and 14,000-kc. grid coils are wound with No. 18 enamelled wire spaced to occupy a length of 1¼ inches. Taps are from the ground end of detector coils. Coil diameters are 1½ inches.

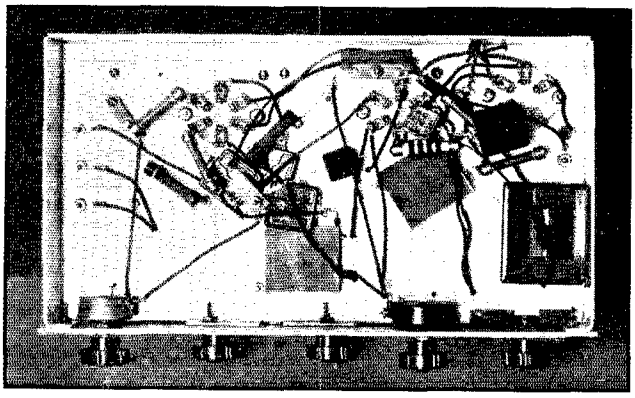
bending them down and breaking them off. When this is done it is necessary to make the contact to the rotor plates through the *front* bearing on the condenser. The rear bearing does not fit tightly enough to make good contact and the condenser will be noisy if an attempt is made to use it. Leave the rear bearing unconnected. The two condensers are connected together mechanically by two small flexible couplings (National) and a piece of ¼-inch round bakelite rod of appropriate length. A metal rod could be used just as well. The dial is also connected to the first condenser through the medium of a flexible coupling. When lined up properly the whole assembly turns with surprising ease.

The two 100-$\mu\mu$fd. padding condensers, also Hammarlunds, are mounted on the panel in the positions shown. The coil sockets (and the tube sockets as well) are of Isolantite. These sockets are used not particularly because of any electrical advantages but because they are mechanically rigid and will stand the strain of changing coils without getting bent out of shape. The coil sockets are mounted on small pillars of ¼-inch metal tubing, just long enough to allow the contacts under the sockets to clear the base. The grid condenser and leak for the detector stage are held from the base by a small metal pillar and are just behind the coil in the detector compartment.

Another photograph shows how the parts are placed under the chassis. R.f. rather than artistic considerations dictated the locations of the various parts. For example, there is only one common ground connection for r.f. on the whole set; around it are clustered all the .01 by-pass condensers in the r.f. circuits and all the other r.f. grounds come to this same point. Resistors and audio condensers are mounted wherever it is most convenient to put them, especially if the pigtails provided on them can be used. Occasionally there is an insulating terminal made by riveting a soldering lug to a small piece of fibre which in turn is fastened to the base.

The audio choke, a small audio transformer made for broadcast replacement purposes, is mounted on the edge of the chassis at the right. Its primary and secondary are connected in series. This particular transformer has a rather definite peak in the vicinity of 1000 cycles and, as a result, contributes a little audio selectivity to the set.

There is little more to be said about the mechanical arrangement of the set. The tuning dial is placed on the left because it is convenient to be able to tune the receiver without getting in the way of copy paper and log books and leave the right hand of the operator free. If you're left-handed, modify the layout to put the dial on the right-hand side. The regeneration control knob is near the tuning knob so both can be worked with one hand conveniently, although not simultaneously.



INFORMAL — BUT EFFECTIVE

A view underneath the base. No particular precautions here except to keep r.f. leads short and all r.f. grounds at one point.

SOME HELPFUL HINTS

A few electrical pointers should be of help, especially to those who have not previously attempted to build a regenerative receiver with a tuned r.f. stage. *Don't try to build a shield for the r.f. and detector stages with a single partition between the two compartments.* A common partition, instead of acting as a shield, actually will couple the two circuits together. As a result the r.f. stage will break into oscillation whenever it is tuned to resonance with the detector. This is not theory; we tried it that way first. Separate boxes, as shown in the photograph, not only stopped the oscillation but also took out practically all tendency toward interlocking of tuning in the two stages on all but the highest frequencies.

As has been mentioned before, all the r.f. grounds in the set come to a single point. Not only that, all parts of the r.f. circuits that of necessity are connected to the panel or chassis at different points — such, for instance, as the connections made by mounting the tuning condensers — are also connected to the common ground through copper wires. No dependence should be placed on contacts to aluminum for r.f.

The circuit used for the detector differs a little in this receiver from the ordinary tickler circuit. It was used because we felt it desirable to use 5-prong coil forms, and in order to use magnetic coupling between the r.f. stage and detector it was necessary to use an oscillating circuit which requires only three connections. The circuit is a

Hartley, using the screen and plate in parallel as the anode and having the cathode tapped up on the coil for regeneration. It somewhat resembles the electron-coupled oscillator — several suggestions for this type of circuit have been received from different amateurs and are described in the Experimenters' Section in this issue — but so far as can be told from ordinary observation its performance is not greatly different from the ordinary regenerative circuit. It is used here largely as a matter of convenience. If 6-prong coil forms are available, the use of the regular tickler circuit is recommended, because then condenser regeneration control, which has much less tuning effect than screen-grid voltage control, can be used. Condenser control does not work with this circuit because the plate and screen are in parallel for r.f., and even if there is no by-pass capacity from one to the ground, the other will take charge and keep the detector oscillating; hence the screen-grid voltage control shown in Fig. 1.

The band spread with the variable condensers specified in Fig. 1 is not "full-dial" on any band, running about 60 degrees (100-division dial) on 3.5 mc., 40 degrees on 7 mc., and 25 degrees on 14 mc. More spread can be obtained by using a smaller tuning condenser. The Hammarlund 3-plate, with a maximum capacity of 20 $\mu\mu$fd., will widen out the bands considerably. Personally we do not care for the larger spread for a receiver with ordinary selectivity because cranking a high-ratio vernier dial over its whole scale to cover a band is a rather lengthy and laborious operation. This is a matter of individual preference, however. Changing to the smaller tuning condensers will not affect the sizes of the coils nor make any changes in the other circuit values.

The Hartley circuit in the detector is a facile oscillator; so much so that the "tickler" — we might call that part of the coil between ground and the cathode tap the tickler — is matter of fractions of turns on the high-frequency bands. The right place for the tap has to be hunted out if the detector is to be controllable with a reasonable value of screen voltage. In this particular set the tap is three turns from ground on 1.75 mc., one turn on 3.5-mc., ½ turn on 7 mc. and ¼ turn on 14 mc.! The taps are made by boring a small hole in the form alongside the point where the tap is to be placed, running a wire through the hole to the pin on the coil form, and soldering to the turn on the coil. All the coils should be "doped" with collodion or a similar material. The 1.75- and 3.5-mc. coils are wound with d.c.c. wire with no spacing between turns; the 7- and 14-mc. coils are wound with enamelled wire to the length specified in Fig. 1, spaced out by hand and then doped to hold the turns in place. A fairly even job can be made when the coil has a dozen or less turns.

With coils of the sizes specified, the amateur bands will be located with the padding or band-spreading condensers set near maximum on the 7- and 14-mc. bands, and at about ⅓ capacity on 3.5 and 1.75 mc. There will be no need for cut and try if the coil specifications are followed; this band-spread system is an easy one to get into operation because slight variations in coils can be compensated for by the condenser settings. Once the right settings of the padding condensers have been determined for all bands appropriate marks can be put on the panel or small paper or metal scales can be made up and calibrated. Setting the padding condensers is not by any means a hair-line adjustment unless it is necessary to have exactly the same dial readings every time one returns to a band. This is a receiver, however, not a frequency meter.

Antenna windings on the r.f. coils run about as with other sets. The primaries for the detector coils are not critical as to number of turns; the values specified give plenty of gain and cause no undue interlocking of tuning. Primaries are close-wound at the bottoms of the coil forms, grid coils at the top.

Strictly speaking, the r.f. gain control is not a volume control and it will not reduce all signals to zero strength, since with only one r.f. stage the range of control is limited. Actually, however, it controls volume nicely even though complete cut-off is not obtainable. The purpose of the resistor R_4 in Fig. 1 is to increase the range of control over that available by the use of R_3 alone in the cathode circuit. With R_4 connected as shown, there is a voltage drop across R_3, because of voltage divider action, which acts in addition to the normal drop caused by plate-current flow. The total bias with all of R_3 included in the circuit is in the neighborhood of 50 volts.

A voltage divider consisting of a pair of small resistors (5-watt size) is included in the receiver so that only two plate leads, plus and minus 200 volts, leave the set. The filaments of the tubes are wired in parallel and are brought out to the power supply through another pair of leads, making only a 4-wire cable necessary. The center-tapped resistor across the filament supply should be included in the power pack. This arrangement, which is used by National in their a.c. short-wave receivers, has been found very effective in keeping r.f. out of the power supply cable and in eliminating hum caused by stray r.f. wanderings.

If batteries are to be used for plate supply, resistors R_5 and R_6 can be omitted and a separate lead brought out for the regeneration control. There should be a switch in the negative battery lead to cut off the current drained through R_4 and R_{10} when the set is not in operation.

The antenna input on the set is arranged so that a doublet antenna can be used, both terminals on the antenna coupling coil being brought out to binding posts which are insulated from the

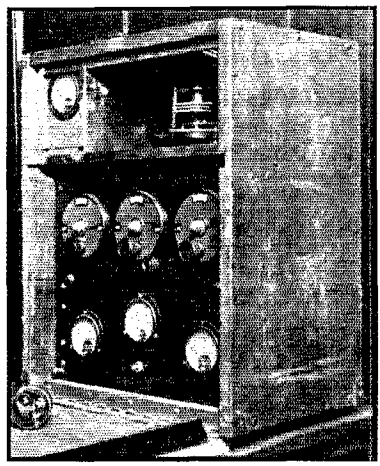
(Continued on page 23)

A Portable that Works at Home or Abroad

By Murray J. Douglas, W6CUG*

THERE often has been a need at W6CUG for a portable station that could be used at various sources of traffic as well as on vacation trips. But the idea of tying up a lot of good parts for occasional use seemed too much for Scotch instincts; on the other hand, cheap, junky parts were out of the question because the set had to be capable of standing up on auto trips of great length. It was therefore decided to design and build the set so it could be used both for portable work and as the regular set at W6CUG for the rest of the time. This was accomplished by making the portable an m.o.p.a. using '10's, and the home unit a 100-watt push-pull amplifier which can be inductively coupled to the portable.

There was no necessity for building the set in a box of hand-baggage size because the car would be available for any trips taken, so effort was bent toward making the portable unit as complete as any home-used set. There is therefore a built-in power supply for 110-volt a.c., allowing the set to be used wherever a.c. is available; in addition to this a pair of dynamotors furnishes emergency power for the transmitter when needed. A separate receiver and 'phones are used at home, so to prepare for a trip it is only necessary to pull the 110-volt plug on the portable, unclip the feeders, put it in the box and be away.



THE PORTABLE M.O.P.A. TRANSMITTER IN ITS CASE, WITH THE FRONT COVER DOWN

The wavemeter is lying on the cover just in front of the transmitter panel. The field-strength meter is at the left in the small space above the panel, with the monitor just behind it. The receiver, lying on its side, can be glimpsed in the compartment to the right of the field-strength meter.

There seems to be a necessity for having a circuit to start with in building a transmitter, so the low-power m.o.p.a. outfit described in September, 1928, *QST*, was selected, since such a transmitter is entirely in keeping with present-day practice. The shielding has the added advantage of keeping dust out of at least part of the set.

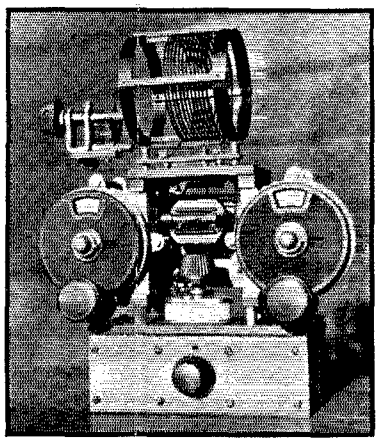
The photograph shows how the transmitter looks when ready for a trip. The whole outfit, including the a.c. power supply, is behind the bakelite panel, which measures 12½ inches high by 15⅛ inches wide by ½-inch thick. The three dials are, from left to right, the antenna condenser, the amplifier tank condenser, and the oscillator tank condenser. The small knob just below the middle dial is the neutralizing condenser, which has a 3-inch fibre extension shaft to eliminate body capacity when neutralizing. The switch at the bottom controls the primary of the power transformer. The meters, from right to left, are the oscillator plate milliammeter, filament voltmeter and amplifier plate milliammeter. Two small knobs in the lower corners assist in getting the set in and out of the case. The base, on which the power supply is mounted, is 14 by 9 inches and is covered with sheet zinc 1/16-inch thick. This is shown in the rear view. The power transformer, a Thordarson T2900, is on the left. Beside it is a Silver-Marshall 331 Unichoke, on which is mounted a 50,000-ohm bleeder. On the right is a bank of six WE-21AA condensers, and between them and the panel is the 10,000-ohm resistor which drops the plate voltage for the oscillator. The filter condensers are held to the base by a strip of steel 3 inches wide and bent so that when the six screws through it are tightened, the tension on the condensers pulls them to the baseboard. The 5-pole double-throw switch, the socket for the 110-volt line, the two sockets for the '81's and the binding posts for the "C" bias and key are all mounted on the base. For the benefit of anyone duplicating the set, I would suggest adding a few inches more to allow making the two small 22-volt "C" batteries a part of the unit and adding a separate filament transformer so the amplifier alone could be keyed in the center tap. The present arrangement has proved very satisfactory, however.

The shelf above the power supply is 8¾ by 14¾ inches and is also zinc covered. The rear central portion is cut away to clear the tops of the '81's.

At the left on the shelf is the oscillator shield, measuring 4¾ by 8¾ by 5¾ inches, also made of zinc. Care must be used in forming the zinc because it cracks easily. Soldering also must be carefully done, since a slight excess of heat may melt a patch out of the can, but its clean-cut appear-

*2417 Jefferson Ave., Berkeley, Calif.

ance is better than that of copper. The objection to aluminum, of course, is that it cannot be soldered.



FRONT VIEW OF THE RECEIVER

The outfit is designed chiefly for compactness and mechanical rigidity. It is a simple regenerative detector and two-stage audio amplifier, using '01-A tubes.

Cardwell condensers are used throughout for tuning. Small angle brackets support fixed condensers and other small parts, which are fitted in wherever space is available. The small r.f. chokes are mounted on ¼-inch fibre pins and small brass angles to keep metal out of their centers. The pins are pressed into the choke forms and one end tapped for 6-32 brass machine screws ¼-inch long. The filament by-pass condensers are mounted directly at the sockets. The neutralizing condenser is mounted on a small piece of bakelite which in turn is fastened to the base by a brass angle.

The amplifier socket is mounted on a small bakelite shelf which is fastened to the back of the tuning condenser by an angle bracket. The center-tap of the filament by-pass condensers is a strip of brass which also acts as a support for the rear end of the shelf which holds the socket.

A small tumble switch in the amplifier high-voltage lead allows the amplifier voltage to be cut off for neutralizing. This switch is mounted on the shelf at the rear of the amplifier tank condenser, insulated, of course, from the zinc.

The coils, described in Fig. 1, are fitted with compression fittings procurable from any automotive supply house. The coupling type is used, filed flat to fit the angle brackets on the condenser and screwed in place.

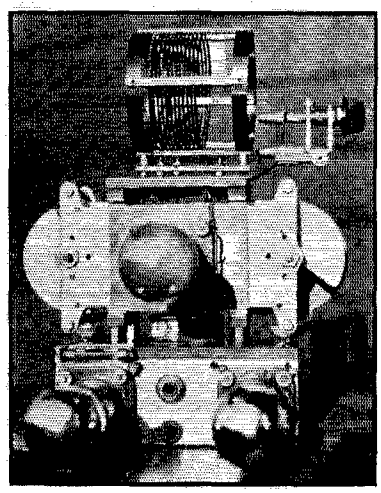
The antenna condenser is mounted on two General Radio stand-off insulators by two pieces of brass bent in the shape of an "L." Holes are drilled in these pieces corresponding to the screws which hold the stator plates of the condenser in place. A binding post is fastened to one of these brass pieces for the antenna lead in. The antenna condenser extension shaft is also fibre, the hole in the panel through which it passes acting as a guide to keep it from wobbling. Since it is close to the amplifier coil, it should not be of metal. One end of the antenna inductance is mounted on a stand-off insulator; the other end is flattened and screwed directly to the condenser.

All leads through the shelf run through rubber grommets (eyelets). A knot in each lead just above the shelf prevents its being pulled loose by an accidental yank. All d.c. leads below the shelf are cabled and all leads are flexible, mostly fixture cord. The fixture cord is skinned, scraped, and an eyelet crimped in place. The end is then dipped in solder. This keeps loose strands from getting too familiar with the zinc shields. The shelf is mounted on Benjamin brackets, reinforced by a piece of brass ⅛-inch thick by 1 inch wide, which acts as a vertical support.

There are two 5/16-inch tapped holes in the base to line up with two holes in the case. In the event that the set is to be shipped by rail there are two hex-head cap-screws that hold it in place. The ribs on the door of the case, visible in the photograph, press the panel against two cold-rolled steel strips mounted in the case in the proper places, thus also contributing to rigidity when the set is ready for shipment.

KEEPING ON FREQUENCY

To make sure the transmitter frequency is set correctly, a fixed-tune wavemeter is part of the



THE TUBES ARE MOUNTED HORIZONTALLY IN THE REAR OF THE RECEIVER

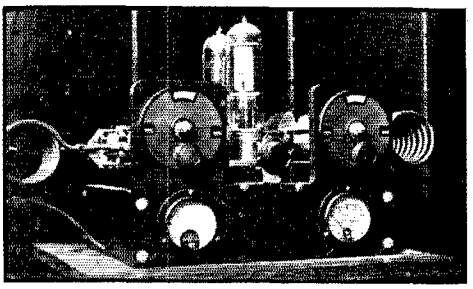
The jack for the 'phones is in the center of the aluminum piece which forms the base for the set.

equipment. It is visible on the door of the case in the front-view photograph, and consists of a bakelite tube two inches in diameter on which

the coil is wound, a small Sangamo fixed condenser screwed to the inside of the tube, and a Christmas tree light socket in another bakelite tube also screwed to the 2-inch tube. The coil has three turns of No. 22 wire cemented in place with collodion. By experiment the thing was adjusted to 7100 kc. and serves as a check in tuning the set to the frequency of the antenna. A final check is taken with the monitor. More of that later.

THE PORTABLE ANTENNA

The antenna is a Hertz affair figured for operation at 7100 kc. For insulation there is a pair of 3-inch Pyrex strain insulators each fitted with a small loop of flexible antenna wire put through the eye of the insulator and through the hole in the end of a male compression fitting and soldered. At the ends are the nuts for the compression fittings, and there is also one at the feeder position of the antenna wire. The feeder is a quarter wavelength long. Another wire the same length as the feeder makes possible the use of either the Hertz or the antenna-counterpoise system. The advantage of this is that if a 210 goes west, just disconnect the amplifier feeder clip and hook the Hertz to the oscillator tank and you are all set for low-power high-C operation.



THE 100-WATT PUSH-PULL AMPLIFIER USED AT THE HOME STATION

For work at the permanent location the output of the portable m.o.p.a. is coupled to this amplifier, which uses a pair of Western-Electric 211-D's.

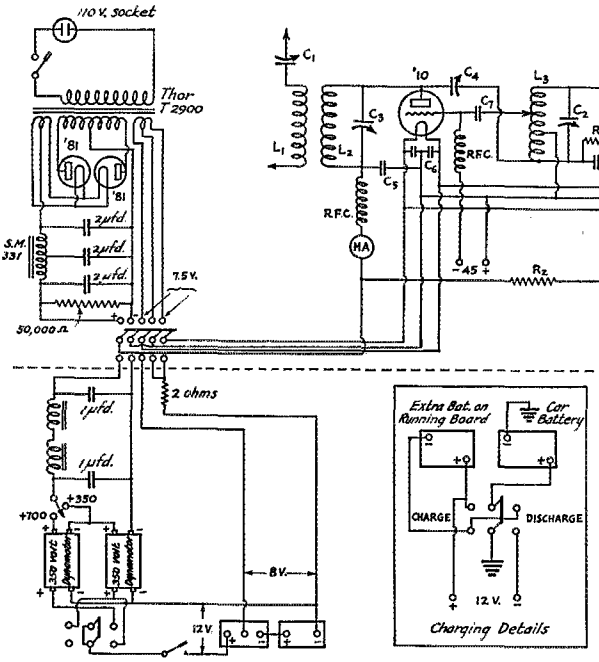


FIG. 1 — WIRING DIAGRAM OF COMPLETE PORTABLE TRANSMITTER AND AUXILIARY POWER SUPPLY

All parts shown above the dotted line are included in the transmitter case. Those below the line are in the dynamotor housing.

C_1, C_3 — *350-μμfd. variable condensers.*
C_2 — *500-μμfd. variable condenser.*
C_4 — *50-μμfd. midget or 100-μμfd. with alternate plates removed.*
C_5 — *.002-μfd. mica condenser.*
C_6 — *.001-μfd. mica condenser.*
C_7 — *100-μμfd. mica condenser.*
C_8 — *250-μμfd. mica condenser.*
C_9 — *.001-μfd. mica condenser.*
R_1 — *10,000 ohms.*
R_2 — *10,000 ohms, 100-watt size.*
RFC — *Three sections of 50 turns No. 30 d.c.c. wire wound in ½-inch slots in a 1-inch wooden form, sections connected in series.*
L_1 — *6 turns 3/16-inch copper tubing, 2½ inches inside diameter.*
L_2 — *10 turns same tubing, 1¾ inches inside diameter.*
L_3 — *6 turns same tubing, 1¾ inches inside diameter.*

Data for coils for other bands will be found in September, 1928, QST, and in the Handbook.

Values of power supply components are shown on the diagram.

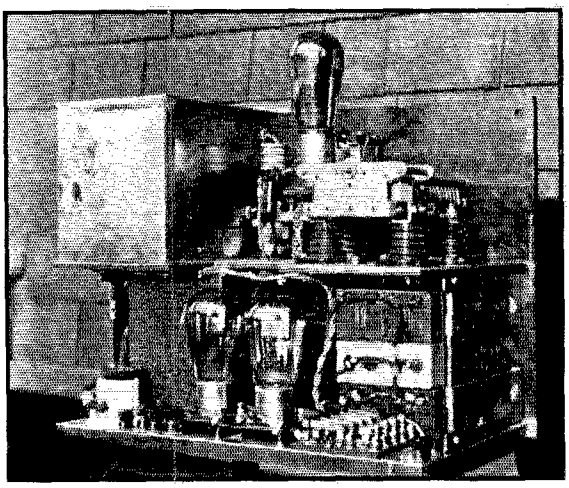
FIELD STRENGTH METER

A field strength meter also is part of the regular equipment at W6CUG, and is too handy to be left at home. It consists of a 4-inch by 5¾-inch metal plate on which is mounted a 0–1 d.c. milliammeter, a fixed crystal detector and a small basket-weave coil. The method of carrying it will be seen in the photo. It is merely a metal clip that slides into a compartment in front of the monitor. There is also room on top of the monitor for the pair of W.E. phones, and they are prevented from shifting by a false front to the monitor that reaches to the top of the can. The field strength meter has stood many trips without a sign of an injury, and is used more than any other piece of apparatus in the tuning of the set.

THE MONITOR

The monitor is part of the regular equipment at the station and is small enough to fit nicely in the case with the transmitter and receiver, so is always taken along. It fits back of the field strength meter and is not visible in the photograph.

This unit is built in a zinc box 4 by 4½ by 8 inches — just large enough to take a 22-volt "B" battery and a 4½-volt "C" battery, and leave a small space in the front for the tube, coil, condenser, etc. A Type '99 tube is used in an ordinary regenerative circuit. A 5-plate Hammarlund midget is used for tuning and a 14-plate Silver-Marshall midget is shunted across it to enable the thing to go to 3500 kc. as well as 7000. A filament control jack takes care of the output. A dummy phone plug with a 2000-ohm resistance across it is plugged into the monitor when spotting the frequency in the receiver. The resistor is used to approximate the resistance of the phones.



REAR VIEW OF THE TRANSMITTER ASSEMBLY

The lower deck is occupied by the power supply equipment. On the shelf above is the r.f. part of the set, with the oscillator in the shield can at the left and the amplifier out in the open at the right.

THE DYNAMOTORS

Possibly the assembly of the dynamotors presents more novel features and the most difficult and varied labor of the whole set. These machines are Signal Corps units, 10 volts input and 350 volts output, and are wired to operate either both in series or one singly. They are mounted in such a way as to be solid in transportation, and since they are carried on the running board of the car must also be protected from dust and rain. The photograph shows the method of mounting.

The frame is made of ¾-inch angle iron bent so that each half of the frame is 12⅝ by 3¾ inches outside. The individual pieces are welded together and squared up with a file. A piece of one-inch angle iron 7 inches long is bolted to the sides at the bottom to act as a means of fastening the unit to the running board of the car and also as a spacer to hold the sides to width. The ends are bakelite paneling fastened to the sides by machine screws.

On one of the ends are mounted three large binding posts for battery connections to the dynamotors and the filaments, and also the d.p.d.t. switch shown in Fig. 1 which connects the batteries to one dynamotor or both in series. The plate switch, filter chokes, filter condensers, and output binding posts are mounted on the opposite end.

The problem of holding the dynamotors rigidly was solved by mounting them in the two aluminum castings shown in the photograph. A wooden pattern was first made and then the finished castings were machined to 6¾ by 12½ by 1½ inches thick. They were then bored out to the diameter of the dynamotors after removing the band that covers the brushes. Before sawing the supports, they are drilled and tapped for ⅜-inch by 24 studs and the top corners of the aluminum blocks are cut away to allow room for the nuts. The blocks are then sawed through the holes to allow the generators to enter, the stud nuts tightened and the whole fastened to the angle iron frame with steel machine screws. Care must be exercised to keep the units square so they will set level and present a workmanlike appearance. The important thing is to square the sides before welding and see to it that the welder doesn't warp them out of shape.

The whole unit is covered with a piece of galvanized iron that is in turn given a good priming and three coats of lacquer. It is fastened to the sides and top by machine screws and is readily removable for oiling, etc.

It will interest some fellows that live near either coast to know that many of the essentials of the portable can be obtained from obsolete army and navy equipment available at various ship and marine junk yards. The filter system, switches, dynamotors and paneling in this job came from there.

THE RECEIVER

Originally the set was equipped with a t.r.f. receiver, but as it was for portable work a great deal of gain was unnecessary. The present receiver was evolved in the attempt to get the smallest, most rigid and foolproof receiver. Front and rear view of this unit are shown in accompanying photographs. The wiring diagram is given in Fig. 2.

The base is made of 16-gauge aluminum, six inches long and just high enough to take a pair of the old Thordarson b.c. audio transformers and the Bradleystat which controls the filaments of the two audio tubes. On it is mounted a bakelite strip 2¾ inches wide by ¼-inch thick.

The Cardwell taper-plate condensers are mounted vertically, using the panel spacers for legs. The holes at the ends of the stator strips are

drilled and tapped for 8-32 machine screws to give strength to the assembly where the condensers are fastened to the base. A piece of brass 2¾ by 3½ inches screwed to the condenser backs acts as a support for the detector tube socket, as well as the common connection from the tuning condenser to the regeneration condenser. The r.f. choke is back of this plate. The front-view photograph shows clearly the location of the detector Bradleystat, grid leak and condenser.

The top shelf, also of bakelite, measures 2¾ by 3½ inches and is drilled to take the mounting jacks for an 80-meter Aero coil which has been cut down to 12 turns. This coil, in conjunction with C_1, covers the 7000-kc. band nicely.

The little antenna condenser, C_3, allows very nice control of the input signal. It is mounted on a small brass arm and has a phone tip jack soldered to it to take the receiving antenna, which rolls up on a small bakelite reel.

No ground is used. The filament control jack and a Yaxley cable connector permit the use of the same batteries that are slung under the car for a b.c.l. receiver. For a stay of a few weeks in camp, a few of the small blocks of "B" batteries are taken along.

The dials are the small Marco, and are mounted on ⅛-inch aluminum pads cut to the same size as the dials. This protects them from rough handling and furnishes a support for the position screw. They are screwed to the original mounting holes on the condenser. Every possible wire has been eliminated and the supports or frame used instead, to minimize loose connections and consequent grief.

The receiver is set in a wooden frame in the case, cut out to the contour of the base.

THE HOME AMPLIFIER

The 100-watt amplifier is the novel feature of the set in that it changes it from a portable to a year-'round affair. The photograph shows the layout, and Fig. 3 shows the wiring. The frame measures 13 by 11 inches deep and the panel is 9 inches high, all being made of ½-inch bakelite. There is a tube shelf 3½ inches wide through the center, and this arrangement leaves room for the blocking condensers and chokes out of sight in the chassis.

The tuning condensers are made from .001 General Instrument broadcast type, double-spaced, and are ganged back-to-back. The ganging is accomplished by removing the end frame screws, cutting the heads off 6–32 machine screws to make studs 1½ inches long, and using the panel spacers for spacers between the condensers. They should be carefully worked in place, using the frame support rods for nuts. They are paralleled with ¼-inch copper strip ⅛-inch thick, fastened to the stators by machine screws.

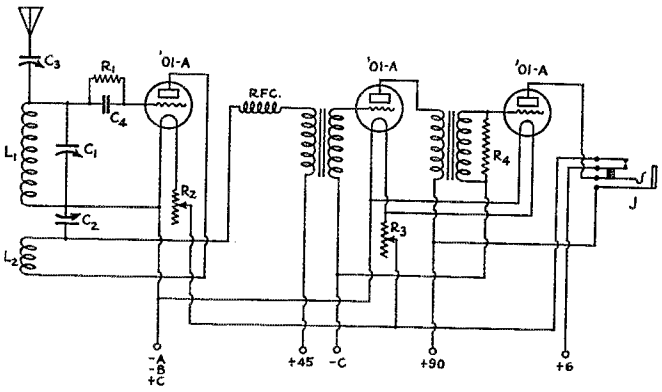


FIG. 2 — THE RECEIVER CIRCUIT

C_1 — Cardwell 3-plate taper-plate condenser, spaced 7/32-inch between rotors.
C_2 — 6-plate Cardwell taper-plate condenser.
C_3 — 2-plate Hammarlund midget, plates spaced 5/32 inch.
C_4 — 150-μμfd. mica condenser.
R_1 — 2-megohm grid leak.
R_2, R_3 — Bradleystats.
R_4 — 50,000 ohms.
RFC — S.M. 277 choke.
J — Filament control jack.
L_1, L_2 — 80-meter Aero coil with grid coil cut to 12 turns.
Audio transformers are small Thordarsons.

The inductances are ¼-inch copper tubing terminating in compression fittings screwed to the condenser frames and sweated just as the screw is tightened. For the benefit of the inexperienced the method of doing this is as follows: Tin both the fitting and the frame with a good coat of solder; file the high spots off the solder and retap the holes, then screw the fittings in place. Heat them with a Bunsen burner or a large hot iron until the solder melts, then tighten the screws so as to ooze the excess solder from the joint. When it cools you have a shakeproof job.

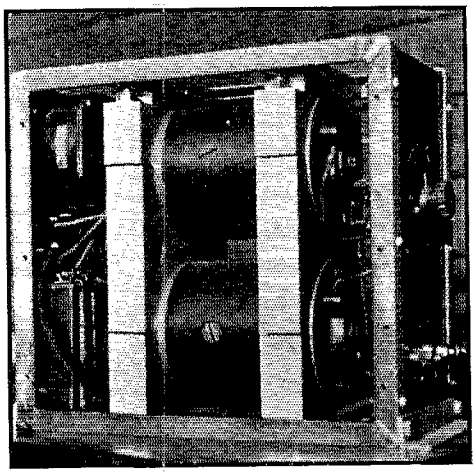
The nuts for the compression fittings and the glands are obtainable separately, so a set can be had for a few cents for each set of coils if a QSY is desired. Coils can be changed with the help of a small open-end wrench.

The two neutralizing condensers are Pilot midgets cut to 6 plates and double-spaced. They are symmetrically mounted on the frame. All wiring is done with ¼-inch by 1/16-inch copper strip.

The r.f. chokes are made of 1-inch hard-rubber rod slotted ⅛-inch wide by ¼-inch deep, three slots per choke. All are wound with No. 30 d.s.c. wire and peaked with a grid meter driver to 75 meters. They are tapped and fastened to the rear

frame with a brass machine screw short enough so it doesn't enter the coil proper.

This amplifier was used as a push-pull t.g.t.p. oscillator for months, and conversion back requires only the addition of a grid leak and disconnecting the neutralizing condensers.



THE MOUNTING FOR THE DYNAMOTORS

This is an angle-iron frame, with two aluminum castings for holding the machines. The filter to take out commutator ripple is mounted in the space at the left. This unit is mounted on the running board of the car, and is covered with a sheet metal housing on trips.

No details of the power supply will be given as they are familiar to anyone building a set of this size.

TUNING THE TRANSMITTER

The tuning process applicable to the m.o.p.a. portable has been thoroughly covered in September, 1928, *QST*, and in the *Handbook*, so there is no need of repeating it here. Only those special adjustments made necessary by portable work will be discussed.

Select the type of antenna best suited to the space available. It has been found at times that a Zepp was best fitted to the job, so it was put up, using the two feeders and the Hertz, but generally the Hertz alone will fit. Attach the insulators to suitable supports with a piece of string and screw the antenna to the insulators with the fittings provided. Plug the 110 in the socket, remove the cover of the oscillator shield, put in the tubes, throw off the amplifier switch and tune the oscillator to resonance with the wavemeter. Then cover the oscillator, couple the field-strength meter to the amplifier tank and tune the amplifier dial for maximum response. Then turn the neutralizing condenser to get minimum reading of the field strength meter. Retune the amplifier tank to maximum field reading and re-neutralize to zero reading. Then throw the amplifier plate switch on and tune the amplifier to resonance, indicated by a dip in the amplifier plate current. Next, get the monitor out and plug in the 'phones. Tune in the signal on the monitor and zero beat it to the receiver so as to be dead certain that the transmitter is in the band at about the natural period of the Hertz. Then give the neutralizing condenser a slight turn to get the cleanest possible signal. It should approach crystal in clearness and purity. Hook the antenna and tune for normal plate current on the amplifier and the set is all ready to go. With a little practice the thing can be tuned in three or four minutes. When beating the monitor to the receiver, the dummy plug is plugged into the monitor and the phones are used for the receiver.

In tuning the 100-watt amplifier at home, the portable is first tuned as described above. The antenna coil is then connected to the grid coil of the final amplifier with a couple of heavy strips of brush braid. With the plate voltage off the final amplifier and the filaments lit, couple the field meter to the final plate coil and neutralize. The method used with other push-pull amplifiers will apply to this one, and the *Handbook* and *QST* should be studied before attempting to put the set on the air.

WHAT THE PORTABLE HAS DONE

A few words about the performance of the portable should not be amiss. The best DX with it was WFBT, using the 210's only. East Coast stations from California were regular diet as the later hours of the evening approached. It is hard to get to the East Coast in the early hours because so many stations are on the air. With the m.g. con-

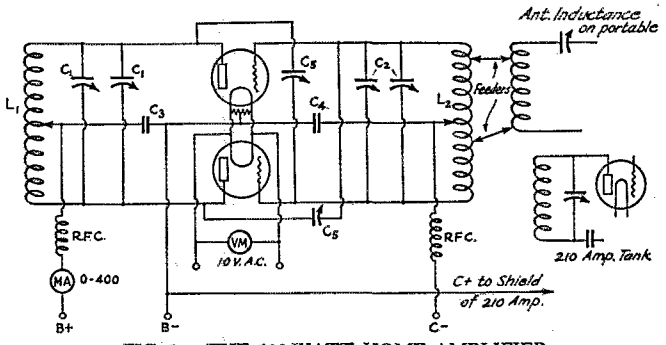


FIG. 3 — THE 100-WATT HOME AMPLIFIER

C_1, C_2 — 43-plate receiving condenser, double-spaced.
C_3, C_4 — Faradon 1846 mica condensers, 75 μμfd.
C_5, C_6 — Pilot midgets, cut to 6 plates, double-spaced.
RFC — Form made of 1-inch hard-rubber rod with 3 slots ⅛-inch wide and ¼-inch deep. Wound full of No. 30 d.s.c.
L_1 — 6 turns ¼-inch copper tubing, 3¼ inches outside diameter.
L_2 — 9 turns same.

nected, no difficulty was experienced in QSO'ing nines in the north central United States.

The set has been available for the usual run of dairy shows and flower shows in which either the Oakland Radio Club or the section put in booths, and hundreds of messages have been gotten off with it.

As for its mechanical construction, the writer carried the set over 8000 miles on a trip East and did not have a single wire come loose — this in spite of roads so rough at times that upon return it was found that the filament coating of one of the '81's was all shaken loose!

Rationalizing the Autodyne

(*Continued from page 16*)

chassis. The ground post is connected to the common r.f. ground. To use the ordinary antenna-ground connection one of the antenna posts is connected to the ground post and the other used for the antenna. More doublet antennas should be used, however. They improve the signal-noise ratio considerably, as has been pointed out in *QST* several times, besides doing a better job of picking up DX signals than the 10-foot indoor antennas that many of us use. A good antenna is worth more than an r.f. stage in bringing up signal strength, and it seems rather silly to build a receiver with an r.f. stage and then cut the antenna down to the point where the signals are the same as they would have been with just the detector and a decent antenna — simply because the gain has not been controllable.

HOW IT WORKS

A word about the performance of this receiver. On all but 14 mc. the tuning of the r.f. stage and detector are almost completely independent; that is, the r.f. stage can be swung through resonance without causing more than a slight change of beat note on a received signal and without affecting detector oscillation. The 14-mc. band does not do quite as well, but even here the interlocking is not as bad as on most of the tuned r.f. receivers we have seen. The gain control does not affect the detector tuning so long as it causes no change in the voltage applied to the detector plate; in other words, with battery supply the gain control would be entirely independent of frequency. With a conventional a.c. plate supply in which no attempt has been made to improve the voltage regulation there will be a slight frequency change in the beat note of a received signal, its magnitude depending upon the extent to which the plate voltage changes when the gain control is operated. The gain control changes the plate and screen-grid current of the r.f. tube from a maximum of something like 11 milliamperes down almost to zero, and with the particular power pack used in testing the receiver this difference in load caused the plate voltage on the detector to swing something like 15 volts — enough to cause a perceptible frequency change even though the circuits are fairly high-*C*. Some neon-bulb voltage regulation evidently would be in order.[2] The frequency change is rarely bothersome, however, because the gain control usually is set for a level which gives desirable volume and then left alone.

The set as it stands is not perfect, of course; nothing ever is. It is a real pleasure, however, to operate a receiver in which the detector does not block, and on which the signals stay put despite normal variations in the power line voltage. It is satisfying to be able to work distant stations almost within beat note of a local ham station. And it is even more satisfying to be able to use a decent-sized receiving antenna and know that when it *is* necessary to go after the weak fellows the r.f. gain is there and the antenna will be big enough to do some good.

[2] "Stabilized B Supply for the A.C. Receiver," Dekker and Keeman, *QST*, October, 1932.

Strays

About the S. S. Receiver

Judging by the questions asked in a goodly proportion of the hundreds of letters that have come in regarding the Single-Signal Superhet described in August and September issues, many readers seem to have missed a few points in reading the articles.

Number one question seems to be, "What's the frequency of the filter crystal?" Answer: The same as the intermediate frequency, around 525 kc. — as stated under Fig. 5 of the August article.

Another question commonly asked is, "Can a 175-kc. intermediate frequency be used instead of 525 kc.?" Answer: Yes, it might be — if the receiver was another receiver and if the factors pointed out as making the 525-kc. i.f. desirable can be ignored.

Others still ask, "What's the capacity of C_{15}?" (inadvertantly missed in August article), even though it is specifically given under Fig. 1, September *QST*.

And the next guy who insists that he reads every word of *QST*, "from cover to cover" . . . ! ! !

Possibly of interest to some constructors are the specifications of the Sickles i.f. filter transformer (L_7L_8). The primary inductance is 5.5 millihenries, the secondary inductance 1.5 millihenries. The coupling between these two universal-wound coils is not critical and is rather tight, a separation of about ¼-inch being generally satisfactory.

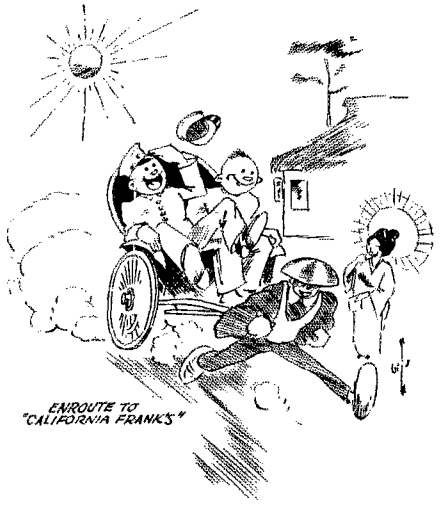
A Japanese Hamfest

By W. S. Upson, Ex-W6IP*

IT'S been a long time since I grabbed the old mill to shoot anything through to HQ, but this is so darned good it's about time something was done about it. So little has been said about foreign hamfests and so much about our own affairs that I hope this will even things up a little.

Just by way of explaining how I happen to know anything about Japanese hamfests, let it be known that KDNV, sometimes known by the uninitiated as the *President Pierce*, would have a hard time behaving herself if it weren't for the juice pumped into her 5-kw. pot and her 1-kw. tube. I'm de guy wot does de pumpin'. Well, we hit Yokohama and Kobe twice each trip and get enough time there to make us want a little more. In good plain English, we like it a lot.

This time we arrived at Yokohama with twelve long hours ahead with nothing to do. We decided to call up Mr. Tsuto Ishii (J1EM), who is one of the engineers at the Yokohama telephone repeater station. We got a rickshaw boy to haul us to "California Frank's" where we hoisted a few. And then from there we sent the boy to Ishii-San with a note. Dunno what Ishii-San told him, but in nothing flat he was back running as if all the demons in China were riding his 'shaw. He herded us into his and another and took us to the telephone office. Oh yes, as part of the introduction, let me say the famous W6ASH, one time high-class ham traffic handler for the Eastbay Section, is now our gallant kid third op and, in case anyone should ask, tell 'em I'm ex-W6IP, but please don't spread it around the waterfront.



Ishii-San was waiting for us, all smiles and bows and with three women (old ones), waiting for us with trays of tea and cakes. That's one good thing

about Japan. If you're hungry, call on a friend. You're sure to get a cup of tea, and it sure hits the spot sometimes. For about a year, J1EO, Mr. Shima of Tokio and myself have been trying to click. Either he has been QRL or I have. This time we got through to him on the 'phone from Ishii-San's office and, wonderful, he was home. He said he'd wait for us to get there and, although we were not dressed for any fancy calling, or high-class receptions, we had no time to change, so off we went. On the way to the Yokohama station, we picked up Mr. Seiichi Nozaki, also of Yoko, who has as yet no transmitting license but only a permit to receive. He expects to be on the air soon, however. We got on the train finally and, about forty minutes later, dropped off at Tokio. Here Shima-San, J1EO, was waiting. Hot Dawg, you should have seen the bowing and scraping that went on. Poor "Ash" hadn't ever met any Japanese people before and didn't know how to bow or say anything. He is only a kid and blushes like a school girl. Of course I broke out my two words of Japanese greeting and then forgot the third. Oh well, we all have our little difficulties.

Up the hill we started toward Shima-San's home, and, believe me, you've only lived half your life until the time you walk up a narrow little lane in some Japanese town, lined on both sides with hedges or fences just high enough so one can get

*2622—25th Ave., Oakland, Calif.

tantalizing glimpses of what's going on inside. And every home has its garden, and the odors of the flowers — aw well, come and see it yourself. Just pick up any magazine and learn to be a first-class commercial operator in twelve easy lessons. We reached his home after walking half a mile or so and, after being greeted in the Japanese manner by a pretty little Japanese maid and removing our shoes, we entered. His home is beautiful to say the least, but this ain't a discussion on arch — well, homes, then, so we went upstairs to the shack. The gang was there, boy, and how! J1CP, J1DI, J1ED and others whose calls I've forgotten. Greetings? Mister, that ain't the half of it, and what was even better, a nice ice cold drink of strawberry juice (unfermented). Of course the set was the first thing we wanted to see. Thirty watts output, crystal control and he's R5 to 6 QSA 4, any morning in the States on a haywire receiver, worked all continents and darned near all countries. But when you see the workmanship in that, and all other Japanese ham sets, you begin to realize how they can do it. The walls of Shima-San's shack are lined on all sides with charts, graphs, and prints. He is a student of the University of Tokio, already holds

"-HAMS ARE HAMS THE WORLD OVER-"

one degree, has invented a new "mike" that's a wow, and designed and installed the public address system used in conjunction with the Far East Olympic Games held in Japan a year or so ago. He's not the only one, either. J3CT of Osaka uses a single 210 and gets across to the States as one of the four loudest "J" stations, and it is seldom his input exceeds forty watts. Poor "Ash," he was sure up in the air. He had expected to see power, and lots of it, and that little aluminum can was a sad disappointment. He was trying to juggle a cup of tea, eat a tea cake and take in receiver and transmitter at the same time. It nearly proved too much for my sense of dignity and decorum, but I managed to hang on.

After we'd seen all the sets and equipment, Shima-San invited us to chow, the universally understood word in the ham language and the most appreciated. We went to another room where the table was set just one foot above the floor level, where the chairs were cushions, and the plates lacquered wooden dishes. The chow was strictly Japanese, served by two very pretty little Japanese maids. (Too darn much QRM in Nippon to make eating altogether a pleasure.) Rice and fish, cooked in the little lacquered dish, seaweed soup and a sauce. Believe me, if you want good chow, come to Japan — but take those twenty easy lessons first. After finishing up everything in sight, Shima-San invited us to take a look at the view from the window of this room. He is way up on a hillside and, looking out, one sees Fuji, Japan's sacred mountain, in the distance, beautiful Tokio and its environs in the foreground and, immediately below, Shima-San's own garden with his little brother and sister playing.

In a few moments we were asked to seat ourselves again and finish our meal with strawberry juice and Japanese watermelon. During the meal a very learned discussion on the relative merits of Japanese and American YL's was held, which only goes to prove that hams are hams the world over and, anyway, you should see some of these Japanese YL's. Finally it was all over and, with a sigh of pure contentment, we arose; that is, all but "Ash." He was so cramped from sitting cross-legged on a cushion that it took three men and the ship's cook to get his legs straightened out.

Well we only get twelve hours in Yokohama and I had a heavy date in Kobe, so we had to leave. Say, you want to take a ride in a Japanese train if you want a real thrill. I've been in China coast typhoons, in Tahantapec gales and Hatteras blows, but never have been seasick except on a Japanese train. Wham!! go, say, the only thing that makes 'em slow down is a red signal, and they only show them on the first day of May and next week at two o'clock. We hung on to straps, stanchions, bags, hats and the ladies' hair and finally reached Yoko right side up and undamaged. The whole gang was with us. I lost count after a while, but I think there were ten of them all wanting to see the ship's s.w. set and to bid these two great hulking noisy foreigners bon voyage. The Quartermaster at the gangway thought it was an invasion and I had to promise him beaucoup trinkets before he'd let us aboard. The gang thought the ship's layout hot stuff and sure had a swell time looking over the ship, my room, including many photos on the bulkheads and the shack. We left Yoko finally to a chorus of banzais and sayonaras from this great gang of chaps on the dock.

The whole thing took me back to the old days when a feller walking down the street of a strange town and seeing an antenna, especially if it had four wires and a white pole, immediately went up and punched the front doorbell and asked to see

the op. Them days is gone forever in the States, but you still are sure of a welcome if you pull it over here. Talk about friendship; say, I'm going to need a third op one of these days, and you want to come over. I'll guarantee you all a heck of a good time and a copy of the JARL Mag.

Standard Frequency Transmissions

Date	*Schedule*	*Station*
Jan. 1, Sunday	C	W6XK
Jan. 6, Friday	A	W6XK
Jan. 8, Sunday	C	W1XP
Jan. 11, Wednesday	A	W1XP
Jan. 13, Friday	B	W9XAN
	B	W6XK
Jan. 18, Wednesday	BB	W1XP
	C	W9XAN
Jan. 20, Friday	B	W9XAN
	A	W6XK
Jan. 25, Wednesday	B	W1XP
	BB	W9XAN
Jan. 27, Friday	BB	W6XK
	A	W9XAN
Jan. 28, Saturday	BX	W6XK
Jan. 29, Sunday	C	W6XK
Feb. 3, Friday	A	W6XK
Feb. 5, Sunday	C	W1XP
Feb. 8, Wednesday	A	W1XP
Feb. 10, Friday	B	W9XAN
	B	W6XK
Feb. 15, Wednesday	BB	W1XP*
	C	W9XAN
Feb. 17, Friday	B	W9XAN
	A	W6XK
Feb. 22, Wednesday	B	W1XP
	BB	W9XAN
Feb. 24, Friday	BB	W6XK
	A	W9XAN
Feb. 25, Saturday	BX	W6XK
Feb. 26, Sunday	C	W6XK

STANDARD FREQUENCY SCHEDULES

Time (p.m.)	*Evening Sched. and Freq. (kc.)* A	B	*Time* (p.m.)	*Afternoon Sched. and Freq. (kc.)* BB	C
8:00	3500	7000	4:00	7000	14,000
8:08	3600	7100	4:08	7100	14,100
8:16	3700	7200	4:16	7200	14,200
8:24	3800	7300	4:24	7300	14,300
8:32	3900		4:32		14,400
8:40	4000				

Time (a.m.)	*Morning Sched. & Freq. (kc.)* BX
6:00	7000
6:08	7100
6:16	7200
6:24	7300

The time specified in the schedules is *local standard time at the transmitting station*. W1XP uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XK Pacific Standard Time.

TRANSMITTING PROCEDURE

The time allotted to each transmission is 8 minutes, divided as follows:

2 minutes — QST QST QST de (station call letters).

3 minutes — Characteristic letter of station followed by call letters and statement of frequency. The characteristic letter of W1XP is "G"; that of W9XAN is "O"; and that of W6XK is "M."

1 minute — Statement of frequency in kilocycles and announcement of next frequency.

2 minutes — Time allowed to change to next frequency.

THE TRANSMITTING STATIONS

W1XP: Massachusetts Institute of Technology, Round Hill Research, South Dartmouth, Mass., Howard A. Chinn in charge.

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

REPORT BLANKS

Blanks for reporting on the S.F. transmissions will be sent postpaid upon request. Just send a card or message to Standard Frequency System, *QST*, West Hartford, Conn., asking for s.f. blanks.

WWV 5000-KC. TRANSMISSION

The 5000-kc. transmissions of the Bureau of Standards station, WWV, are given every Tuesday from 10:00 a.m. to 12 noon and from 8:00 to 10:00 p.m., E.S.T. The accuracy of these transmissions is to better than 1 cycle (one in five million). Information on how to receive and utilize the signals is given in Letter Circular LC-335, obtainable on request from the Bureau. Communications concerning these transmissions and reports on their reception should be addressed to Bureau of Standards, Washington, D. C.

—*J. J. L.*

Silent Keys

It is with deep regret that we record the passing of these amateurs:

William B. Backer, W2AAR, New York City.

Henry L. Krichbaum, ex-W8BWZ, East Cleveland, Ohio.

Norvell W. Matthews, W5CMA, Abilene, Texas.

Willard J. McElree, W9FBO, University City, Mo.

Frank B. Minor, W1BLM, Derby, Conn.

Thomas B. Norris, W2BFC, Richmond Hill, N. Y.

Joseph K. Siler, W9IKW, Chicago, Ill.

Election Returns—de W1MK

THANKS, gang, for your telegrams, radiograms, QSLs, and letters reporting in detail on reception of the election-evening transmission addressed "to all A.R.R.L. Members and Radio

(Continued on page 52)

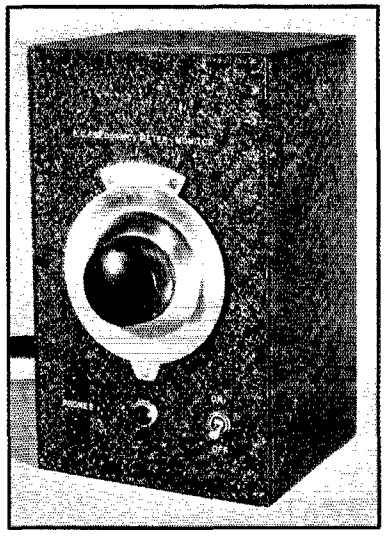
Combining the Frequency Meter and Monitor

Adding an Output Detector to the Electron-Coupled Frequency Meter

By Clyde J. Houldson*

SEVERAL years ago if our wave exceeded 200 meters, one of our brother amateurs merely told us that it was approaching that of the (few) broadcasting stations — then we calmly retuned the old sure-fire circuit and started all over again. Now the problem is entirely different. With some 150 A.R.R.L. Official Observer stations and several government monitoring stations listening and checking for off-frequency operation, it behooves every amateur to have some sort of frequency measuring device in order to know that his signals are within the channels set aside for amateur operation.

One of the stablest oscillators known at the present time is the electron-coupled type, previously described for frequency meter use in July, 1932, *QST*. Because of its frequency stability with large changes in plate voltage, its ability to generate harmonics and to retain calibration over a long period of time, as well as the many other points of superiority that have been set forth, this oscillator is finding increasing use in the heterodyne frequency meter. When the new frequency meter was planned, it was desired to eliminate the monitor then in use and to replace it with a unit that would serve as a combined frequency meter and monitor. This, at first, presented difficulties. However, after experimenting with several breadboard model electron-coupled oscillators it was found that the phones could be connected in the screen-grid or plate lead and give a fairly satisfactory signal. This permitted the electron-coupled oscillator to be used alone and promised to accomplish the work equally as well as the two separate units ordinarily required. Using the oscillator alone, the phones should be connected in the plate lead, as this seems to have the least effect on the frequency stability.



THE E. C. FREQUENCY METER-MONITOR DESCRIBED BY W1KP

From left to right below the tuning dial are the phone tip jacks, indicator light and "B" supply switch. The engraving and black crackle finish give the finished product that professional touch.

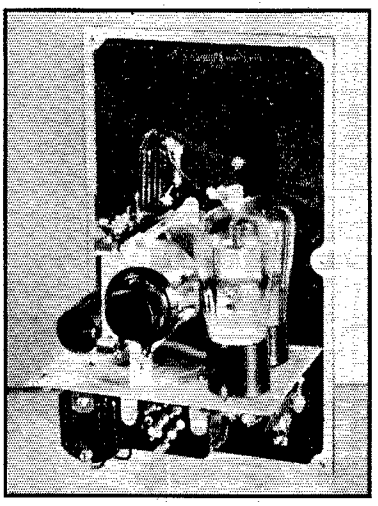
Desiring a huskier signal than that given by the incidental detection of the oscillator, a separate detector tube was added, with small r.f. coupling to the oscillator's plate. This gave a completely satisfactory signal and did not complicate the operating procedure. Connecting the phones in the detector plate circuit in no way disturbs the oscillator circuit. The detector being of the linear type, its output is nearly independent of the signal from the oscillator and proportional to the strength of the signal being monitored, since the outside signal is of much less amplitude at the grid of the detector than the strong signal from the oscillator to which the detector grid is coupled.

It was decided to shield the unit completely and it is therefore mounted in a cast aluminum box that measures 10 by 6 by 5 inches and has sufficient space to house both the oscillator and the detector. The wall thickness of this box is approximately $^3/_{16}$ inch and it is $\frac{1}{4}$ inch at the points where the front and back covers meet. This makes a solid and well-shielded job to start with. If a cheap and flimsy shield is to be used plenty of trouble can be expected. It is necessary to make the job as rigid and as mechanically strong as possible. Sheet aluminum having a thickness of $\frac{1}{8}$- to $^3/_{16}$-inch might be used if the box is to be constructed. Aluminum angles should be used in assembling the sheet aluminum and be drilled and tapped for 8-32 screws. If riveting, welding or any other means can be employed in making the box as strong as possible, it should be used. Enough regarding shielding.

Many condenser-coil combinations could be

*A.R.R.L. Technical Information Service, West Hartford, Conn.

worked out for covering the 1715-kc. band and giving, at the same time, the desired band spread. This one employs a Cardwell "Midway" Type 517 and a "Midway" 518 assembled as a single unit. The larger condenser has a maximum capacity of 50 $\mu\mu$fd. and a minimum of 8 $\mu\mu$fd. It is adjusted so that the oscillator tunes to the low-frequency end of the 1715-kc. band and is then locked into position by means of a lock-nut on the shaft. The tuning is done by adjusting the small three-plate unit, which has a minimum capacity of 7 $\mu\mu$fd., and a maximum capacity of 26 $\mu\mu$fd. Other condensers that would be suited for this purpose would include the General Radio Type 557, National Type 40–75, REL 187-E and the Hammarlund Type MC-20S combined with the MC-75M. Needless to say, the condenser assembly should be rigid and one having end or side thrust should not be used. If possible, a condenser having fitted bearings both front and rear should be used.



THE ESSENTIALS ARE ALL SUPPORTED FROM THE FRONT PANEL

The screen-grid oscillator tube and triode detector sit side by side to the right of the double-section tuning condenser, the rear section of which is adjustable by the knob shown. The coil is on the other side of the condenser. By-passes, resistors, etc., are below.

The circuit is shown in Fig. 1 and employs a Type 24-A tube as the oscillator and a Type 56 as the detector. In order to make leads as short as possible, the 24-A was mounted at the rear and the 56 near the front of the aluminum shelf supporting the tubes and sockets. This aluminum shelf, by the way, is mounted on brackets connected to the front panel, which tend to make it rigid and prevent any movement of parts due to vibration or when tuning. The grid condenser, which has a capacity of 100 $\mu\mu$fd., is mounted on one of the stator terminals of the tuning condenser. A small ½- by ½-inch brass angle is used in mounting the grid condenser. The small one-half watt 100,000-ohm grid resistor is connected between the terminals of the grid condenser and is supported by its pigtails. A short lead from the top of the grid condenser connects to the grid of the 24-A by means of a grid clip.

The coil consists of 79 turns of No. 30 wire wound on a bakelite tube one inch in diameter. At the 23rd turn from the grounded end of the coil a tap should be made for connection to the cathode of the 24-A. After the coil is finished it should be given a good coating of collodion, "airplane dope" or clear Duco, which will prevent it from becoming loose on the form or absorbing moisture and thereby changing its characteristics. Also, it is always a good idea to wind on a few extra turns for the grid-to-cathode portion of the coil. These turns can be removed when the coil is adjusted in order to obtain the desired band spread. The exact number of turns will probably differ to a slight degree, due to the capacity existing between the wiring, condenser used, etc. But the coil can be adjusted very easily and requires only a few minutes of time. By using this coil and condenser combination the spread obtained on the 80-meter band is nearly 100 dial divisions.

The 1-inch coil form is mounted at the bottom stator terminals of the variable condenser by small brass angles. Originally the coil was mounted on the top stator terminals, near the grid condenser, but by mounting in the position shown, the cathode lead was shortened approximately 3 inches. This lead runs from the tap on the coil directly across the set to the cathode terminal on the 24-A socket. Since it is "above ground," it should be as short and as rigid as possible. Probably it would be a good idea to mount the coil so that it would be even nearer to the socket terminals. In this particular set-up, however, this was not possible.

By-pass condensers of several different sizes were tried, the .01-μfd. seeming to give the best results. As can be seen, the four .01-μfd. condensers are mounted directly below the oscillator coil. The common or "grounded" ends of the by-pass condensers are connected by 6–32 screws approximately 2½ inches long, the condensers being threaded on the screw and also spaced by using lock washers and nuts. By adjusting the nuts it is possible to lock the condensers in the desired position and also make them rigid. The entire assembly is then mounted by using ½- by ½-inch brass angles and secured to the bottom of the shelf with 6–32 screws. The other terminals of the condensers go to the heater, plate and screen-grid leads where they enter the cabinet on the Yaxley plug.

Several values were tried for the coupling condenser between the 24-A and the 56, ranging from 40 $\mu\mu$fd. to .01 μfd. However, it was found best to keep the load on the oscillator as low as possible and, therefore, the 40-$\mu\mu$fd. size is used in this unit. It is mounted by pigtail leads between the 24-A plate and 56 grid circuit. Most of the parts and the method of their mounting can

be seen in the rear view photo, incidentally.

Amateurs usually have shielding of a variety of dimensions around their respective radio shacks and, therefore, the mechanical layout must depend somewhat on the cabinet material available. The size of the cabinet in this case prohibited the large 6-inch type dial, so its smaller companion, the 4-inch dial, was pressed into service. This makes it possible to read to one-tenth of a dial division, an especially helpful feature for re-set purposes. The red indicator lamp on the front panel is a very handy device and reduces the possibility of leaving the meter on over night — as was done several times before the light was added. If more outside pickup is desired, a lead can be brought out from the grid of the 56-detector. By attaching a short "aerial" extending outside the box, plenty of pickup for nominal headphone operation can be obtained.

In choosing the detector, first a Type '27 was used, but this was soon discarded in favor of the Type 56. This seems to work considerably better than the '27 and at the same time draws a lower plate current, making the load easier for the batteries or power pack. With 135 volts on the plate of the 56, 90 on the plate of the 24-A and 45 on the screen grid, the combined current is 2 milliamperes. The one-megohm grid resistor is recommended for use with the Type 56 tube and is used. This resistor, together with the 100,000-ohm cathode resistor and the .25-μfd. fixed condenser, are mounted by their pigtail connections and, therefore, are self-supporting. The phones are connected in the plate circuit of the 56 by means of phone tip jacks, mounted on the front panel. A small toggle switch is connected in the negative B lead so it is possible to stop the oscillator but leave the 2.5-volt heaters on during the listening period. Otherwise, when working a station near your own frequency it will be necessary to detune the oscillator in order to hear the incoming signal on the receiver. Closing or opening the switch makes it possible to listen to your own transmitter and then cut off the oscillator when receiving. In order to monitor the signals of the transmitter, some means of quickly changing the phones from the output circuit of the receiver to the output of the monitor must be employed. This is accomplished by a double-pole double-throw switch, conveniently mounted on the operating table.

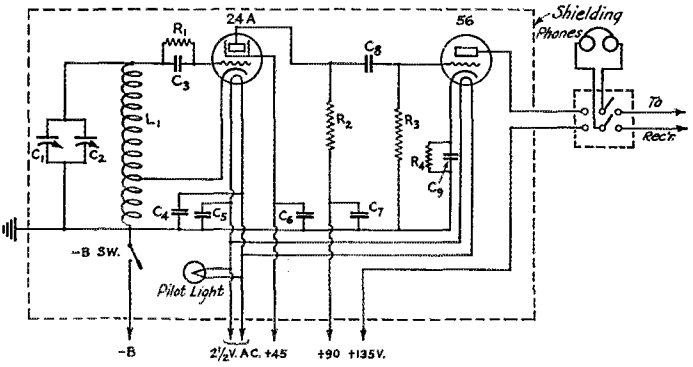
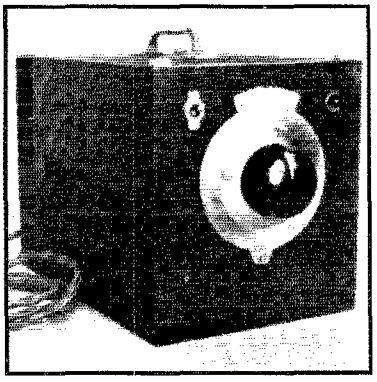


FIG. 1 — CIRCUIT OF THE W1KP FREQMETER-MONITOR

C1 — 3-plate Cardwell Midway Type 401-B, maximum capacity 26 μμfd., minimum capacity 7 μμfd. (See text.)
C2 — 5-plate Cardwell Midway Type 402-B, maximum capacity 50 μμfd., minimum 8 μμfd.
C3 — .0001-μfd. fixed condenser.
C4, C5, C6, C7, — .01-μfd. fixed by-pass condensers.
C8 — 40-μμfd. fixed coupling condenser.
C9 — .25-μfd. fixed condenser.
R1 — 100,000-ohm ½-watt size.
R2 — 100,000-ohm 1-watt size.
R3 — 1-megohm 1-watt size.
R4 — 100,000-ohm 1-watt size.
L1 — 79 turns No. 30 d.s.c. wire on a 1-inch diameter tube. Cathode tap should be at 23rd turn from "ground" end. The heater and "B" supplies may be from the receiver power pack.

CALIBRATION

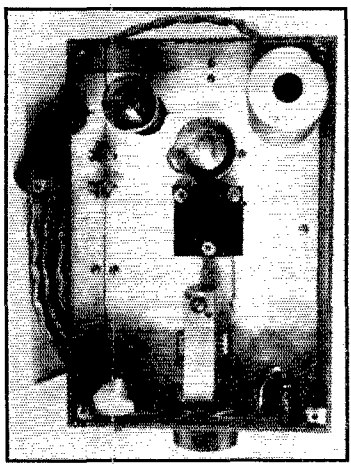
After the meter is finished and the coil adjusted for the desired band spread it should be calibrated against a frequency standard. Several means can be used, such as A.R.R.L. Standard Frequency signals from W1XP, W9XAN and W6XK; WWV transmissions, or harmonics from broadcasting stations. Originally, this meter was designed for operation on the broadcast band (880 to 1000 kc.), but the broadcast receiver was in-



W9UZ's FREQMETER-MONITOR UNIT INCLUDES ITS OWN POWER SUPPLY

It is generally similar in other respects to the one previously described.

adequate and it was not possible to pick up enough stations to obtain the desired calibration points. The electron-coupled oscillator being an excellent harmonic generator, the harmonics were unusually strong on even the 20-meter band. This type of calibration could be made to work out very well, however, since the Federal Radio Commission's General Order Number 116 requires the broadcast stations to be within 50 cycles of their assigned frequency. With a good broadcast receiver it would be possible to check



VIEWED FROM THE TOP, SHOWING TUBES, TUNING CONDENSER AND COIL
The power transformer, filter, resistors, etc., are below.

the meter any time one might desire. After the broadcast set failed, the coil was revamped for 1715- to 2000-kc. coverage. To date the meter has been checked four times against the 3500- and 7000-kc. signals from W1XP and W9XAN, respectively, and holds calibration very well. Before calibrating or rechecking, the meter should be turned on and allowed to warm up. This allows the tubes to reach a constant operating temperature and eliminates the possibility of frequency drift during calibration. Usually 30 to 45 minutes is more than sufficient time for the meter to "settle down" to a constant value.

PRECAUTIONS

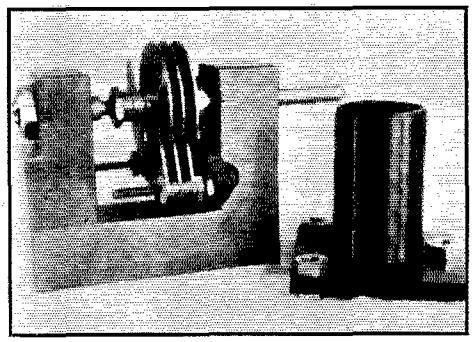
Actually, it is hardly necessary to set forth the troubles that a constructor might encounter. Very few exist. If the parts are not defective (especially the 24-A) and are wired correctly, then the oscillator usually starts right off. A few amateurs have written in stating that they could not obtain strong harmonics from this type of oscillator on the 7- and 14-mc. bands. The strength of these harmonics can be increased somewhat by enlarging the portion of the coil between the cathode and negative "B" or ground connections. This lack of strength on the 7- and 14-mc. bands seems to be the exception, since meters that have been built here all deliver very strong harmonics. The 14-mc. band harmonics from this one nearly block the receiver. If the cathode-ground section of the coil is made too large, the result will be excessive feed-back and instability. This can be detected, by listening to the oscillator in the receiver, when the note sounds like it had several r.a.c. signals each side of the main frequency. It can be corrected by decreasing the resistance of the grid leak or moving the cathode tap down on the coil. As a rule the cathode-ground portion of the coil should consist of approximately one-third of the entire coil, which proportion minimizes the possibility of getting the r.a.c. signal effect and in most instances gives good husky harmonics on the 14- and 7-mc. bands.

All in all, the electron-coupled type frequency meter is an excellent unit, especially when combined with a good detector to provide monitoring, and is recommended for use at all amateur stations — whether they use self-excited or costly m.o.p.a. crystal sets.

A Complete Self-Contained Frequency Meter-Monitor

By Fred H. Schnell, W9UZ*

LOOKING for a transmitting station in any of the much used amateur bands is like looking for the bottom of the ocean. You can find it if you stay close to the shore, but when you get into deep water it is something else. With the number of operating stations increasing every day, the business of hunting for a station with which you have a schedule is almost a hopeless task, *unless* you know the frequency of the station and have a



THE PLUG-IN COIL AND HAND-MADE TUNING CONDENSER USED IN W9UZ's UNIT

means of knowing when your receiver is tuned to that frequency. Further, any amateur who is

* 4915 N. Sawyer Ave., Chicago, Ill.

without a good frequency "standard" is missing many joyful opportunities which are available.

Frequency meters and monitors have not been all that is expected of them, if judgment may be made on casual remarks heard here and there around the country. Either the gadget doesn't stay put, or the batteries are dead or the signal from the transmitter is too weak when using it as a monitor. Each one of these things is true in one case or another. Many different types have been used at W9UZ and finally this present one cleared the room of everything else that had been used. During a ten-hour test for frequency drift (after warming it up for a half hour) and checking every two hours or so, the greatest change and which might easily be an error in reading the calibration curve, was less than 1 kilocycle. The frequency range (for the 7-mc. band) is from 90 dial divisions to 30 dial divisions, making a satisfactory spread for this amateur band, using the National Type VND (100-0) dial.

Since the output from the oscillator at the fundamental frequency was more than ample for the receiver, the circuit actually tunes to one-half the frequency range given above. At this harmonic, the generated signal can be made sufficiently strong to block out any incoming signal which will still permit the receiver to function. Operating as a monitor, the signal from the transmitter is kept at an audibility approximating average readable signals. It doesn't knock the ears dumb nor does it make one squint to read the signals.

The simplicity of this device can best be understood by looking at the wiring diagram of Fig. 2 and photos. The power transformer has three secondary windings; two 2½-volt filament windings and one 160-volt plate winding. The 82 rectifier takes 3.0 amperes at 2½ volts. This tube requires one of the filament secondaries. The other two tubes, oscillator and detector, and the red indicator light are connected to the other heater secondary. The oscillator plate voltage is 105 and the screen-grid 80. Changing from about 90 to 120 volts on the plate made no perceptible change in frequency.

The ratio of coil inductance is 3 to 1; that is, one-fourth of the total turns are used between cathode and ground. There are 60 turns in all, tapped at 15 turns.

NOTE. — Using a National Type 35-70 (band-spread) condenser and an inductance of 38 turns, with the cathode tap at 11 turns, the fundamental frequency range is 3400 kc. to 4375 kc.

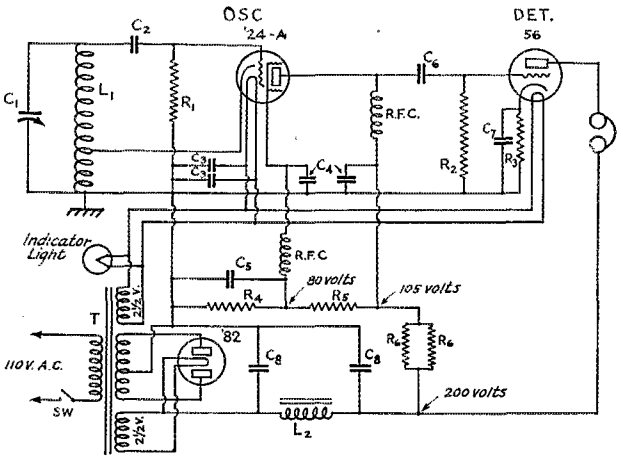
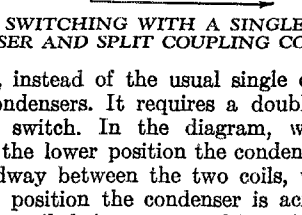


FIG. 2 — CIRCUIT OF W9UZ's FREQMETER-MONITOR

It contains its own power pack.
C_1 — *Band-spread tuning condenser.*
C_2 — *250-μfd. grid condenser.*
C_3 — *0.2-μfd. by-pass condensers.*
C_4 — *200-μfd. by-pass condenser.*
C_5 — *0.5-μfd. by-pass condenser.*
C_6 — *4-μfd. (approximately) coupling condenser. Can be two pieces of insulated bus wire overlapped an inch or so.*
C_7 — *1.0-μfd. by-pass condenser.*
C_8 — *8-μfd. electrolytic filter condensers.*
L_1 — *Oscillator coil. See text.*
L_2 — *10-henry filter choke.*
R_1 — *100,000-ohm oscillator grid leak, 1-watt.*
R_2 — *Detector grid coupling resistor, 1-megohm 1-watt.*
R_3 — *Detector cathode resistor, 100,000-ohm 1-watt.*
R_4 — *10,000-ohm 1-watt (voltage divider).*
R_5 — *12,000-ohm 1-watt (voltage divider).*
R_6 — *Each 25,000-ohm 1-watt. (Equivalent to 12,500-ohms.)*
RFC — *1.3-millihenry radio-frequency chokes.*
T — *Plate and filament transformer. (Receiver power-pack type.)*

Series-Parallel Feeder Switch

AFTER seeing the Zepp feeder switching arrangements in *QST* some months ago, W3CBM contributes the one herewith for those of us who are coupling to push-pull oscillators or amplifiers with two coils and a single tuning condenser, instead of the usual single coil and pair of condensers. It requires a double-throw three-pole switch. In the diagram, with the switch in the lower position the condenser is in series, midway between the two coils, while in the upper position the condenser is across the feeders, the coils being connected in series.



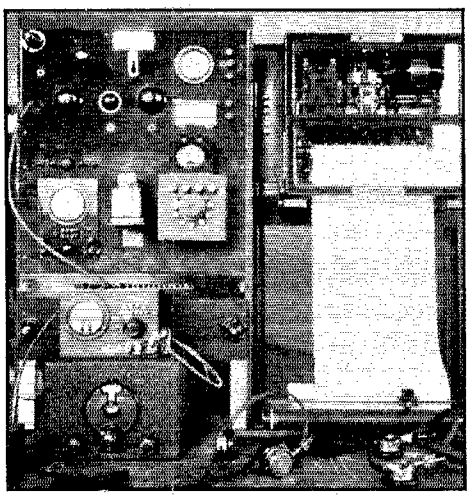
FEEDER SWITCHING WITH A SINGLE CONDENSER AND SPLIT COUPLING COIL

Amateur Observations During the Total Eclipse of the Sun

By R. W. Woodward, W1EAO*

THE total eclipse of the sun on August 31, 1932, afforded a wonderful opportunity for the radio amateur to contribute to our scientific knowledge of short-wave transmission phenomena, and more particularly to obtain information which would lend support to one or the other of two rival theories concerning the origin of the Kennelly-Heavyside Layers.

One theory supposes that the ionization of the reflecting layers (both the so-called E and F layers) in the upper atmosphere is caused, for the most part, by ultra-violet light from the sun. The other theory holds that the ionization of the lower, or E layer, is produced by neutral particles or corpuscles streaming from the sun at a rate of a thousand miles per second. If the first theory is tenable, any effect on radio transmission during the eclipse should correspond approximately with the time of the visible eclipse. On the other hand, if the corpuscular theory is acceptable, the effect on radio propagation should precede the visible eclipse by some two hours due to the slower velocities of the corpuscles coming from the sun as compared to the speed of light. Whereas the visible total eclipse cut a swath only about 100 miles wide across a part of New England and eastern Canada, the "corpuscular eclipse" would be maximum on a path starting from Spitzbergen, through Greenland, the mid-Atlantic Ocean, and ending at lower Spain. It would cover a path about 1600 miles wide, not touching the United States.



EQUIPMENT USED AT THE CASE SCHOOL OF APPLIED SCIENCE, CLEVELAND, FOR GRAPHICAL RECORDING OF THE SIGNALS OF W1EKL

The output of the receiver was fed through a vacuum-tube voltmeter to the standard Leeds and Northrup recorder with paper speed stepped up to record rapid variations. This work was under the direction of J. R. Martin, Assistant Professor of Electrical Communications, assisted by W. E. Slabaugh, W8CIM, and L. W. Fraser, W8DGP. Thanks are due to Mr. Fraser for this information, including the photographs and copy of the recording shown in Fig. 6.

As requested in *QST*, by Official Broadcasts and by letter to Official Observers, a great many A.R.R.L. members all over the country and in some European countries sent in reports to headquarters on their observations during the eclipse. Particular attention was directed to the transmissions of W1EKL, a portable station located at Douglas Hill, Maine, in the path of totality by a party from the Warner & Swasey Observatory of Cleveland, Ohio. Prior announcements indicated that this station would transmit c.w. on 3550 or 7100 kc. between the hours of 1400 G.C.T. (9 a.m. E.S.T.) and 2300 G.C.T. (6 p.m. E.S.T.), but implied that the 80-meter (3550-kc.) wave would be used. Observations on intensity of received signals, preferably by means of a suitable output meter, throughout the entire period were desired. On the day before the eclipse it was determined that the 80-meter signal was not strong enough for automatic recording in Cleveland, so that it was necessary to use a frequency in the 40-meter band. Actually during the eclipse transmission a frequency of 7150 kc. was used. Because of this change in the frequency practically no reports on reception of W1EKL were received at headquarters as many of the reports indicated that watch was kept for W1EKL on 80 meters. Also because of skip distance the station on 40 meters could not be heard in the eastern part of the U. S. A. It is understood, however, that very satisfactory automatic records were obtained in Cleveland and also that many reports of reception were received direct by W1EKL.

Possibly also many of the eastern observers did as the writer, who, after spending several days arranging equipment to take intensity measurements during the eclipse, and in spite of rain at the time, hopped in the car a few hours before the eclipse and drove to Maine for a ring-side seat. At any rate, many A.R.R.L. emblems were seen on the road.

*Official Observer, A.R.R.L., 194 Warrenton Ave., West Hartford, Conn.

W1BZI operated by F. S. Huddy at Chepachet, R. I., where the eclipse was 98% total, made special eclipse transmissions on 3896 kc. between 1900 G.C.T. and 2100 G.C.T. (2 and 4 p.m. E.S.T.) and was reported by many observers, several of whom gave very complete readings from vacuum-tube voltmeters in the output of receivers. Some submitted reports from privately arranged schedules, others of reception of commercial stations, and still others logs of scattered reception of many stations on the air at the time. The data included results on the 5-, 20-, 40-, 80-, and 160-meter amateur bands, broadcast band, and long wave commercial. Several also submitted interesting data on accompanying phenomena such as static conditions, atmospheric pressure, temperature, clouds, wind, and light intensity.

In spite of the request to take observations throughout the day, the majority failed to do so, reporting only for a short period before totality and a still shorter period after totality. This was important not only from the standpoint of testing the "corpuscular" theory, but also, particularly on 20 meters where longer distances were involved, the time of the maximum of the eclipse was quite different in the several sections of the country. Thus the maximum of 38% totality occurred in Seattle, Wash., at 1927 G.C.T. (2:27 p.m. E.S.T., 11:27 a.m. P.S.T.), at Talahassee, Fla., the maximum of 68% was at 2047 G.C.T. (3:47 p.m. E.S.T.), while the time of totality in New England was approximately 2030 G.C.T. (3:30 p.m. E.S.T.).

The following contributed reports on their results to headquarters:

W1- AFC, AGA, APK, ASP, ATW, AZQ, BBM, CTG, DGC, DIJ, MX, ST, VF; W2- BJZ, EB; W3- AAJ, AXJ, CL, DZ, QL; W4- ADA, AJS, AYF, PM; W5- AAQ, ARJ; W6- DLV, RJ; W8- AJ, AJK, ATN, CBF, DED; W9- ABS, AKJ, AN, AOG, BN, EGE, EQW, FMX, RS, Chas. E. Dewey, Jr.; VE4EL; F8RJ; G2JA at sea on S.S. *Rangitiki;* ON4AU.

The reports received showed that the following stations were heard during the eclipse period, many transmitting special test signals. A great many reports did not list individual stations but classified their results by districts so that no doubt hundreds of additional stations also contributed to the results.

W1- ABM, ABY, ADN, AHK, AKI, APJ, APK, AT, AVK, AYR, BBT, BCD, BDW, BIC, BGY, BTZ, BWP, BXC, BZB, BZD, BZI, CAC, CBJ, CKT, CKU, CLH, CMX, CNC, CPC, CPT, CVJ, CVR, CYN, DIJ, DZF, EKL, FH, GB, HE, HI, JJ, MX, SI, ST, SZ, ZC; W2- ABT, AHE, AIS, AWF, BHZ, BJV, BOT, BPV, BRO, BTZ, CJM, COJ, COK, DNG, DTO, DZ, GO, GT, NV, ZC, ZT; W3- AGI, ANA, AO, AQI, AQR, AUA, AXR, AZC, BIN, BLE, BMA, BNB, BOL, BXN, BYN, CDG, CEU, CGU, CLG, CNU, COZ, CUP, DIR, DR, LA, OA; W4- ADA, AGD, AJX, APJ, ATS, AUA, AWP, BIO, BL, BOJ, BQO, DV, GI, OI, OT, QQ, UT; W5- AAK, ABW, AOT, ATS, BBR, BED, CAI, COC, JV, LP; W6- CTM, CXW, DOB, DZZ, USA; W8- AFQ, AGU, AHF, AKU, APQ, AZQ, BAS, BM, BOG, BTB, CBF, CBM, CDY, CI, CIF, CIP, CSH, CTE, CTF, CXH, DHC, DIL, DJV, DMW, DWV, DYE, ECD, EEN, ELF, EYU, FBT, FGE, FNN, FQE, FXM, GCF, GFI, GFT, GTE, HEL, HII, SE; W9- AN, ARK, AUH, BDR, BHH, BOF, CJJ, CME, CMZ, CNG, DGN, DKL, DYG, ENR, FFA, FKK, FMK, FPA, FWB, FZL, GHX, GJC, HOS, HPQ, HUZ, HWE, IMB, IPP, IZP, JBM, JBQ, JHL, JJX; AB1; K5AA; VE- 1EA, 2AW, 2BF, 2GH, 3AQ, 3TT, 9AA; CM- 2FM, 2WD, 8VE; EAR- 96, 155, 185, 224, 228; F8- BS, OL, RJ; G- 2BM, 2OP, 2ZP, 5NF. 5OJ, 6CL; HAF3FV; HK1Z; LU3DE;

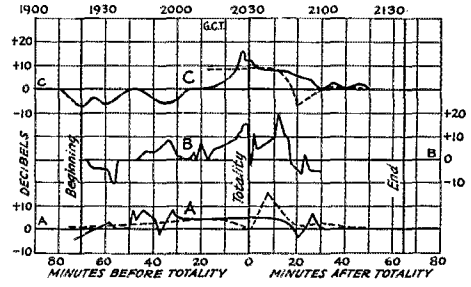


FIG. 1 — 3500-KC. BAND, 90 TO 100% TOTALITY
A — Less than 50 miles.
B — 50 to 200 miles.
C — 200 to 500 miles.

OK2CM; ON4AU; PY2BN; VP2- DB, DD; SU1EC; and the following commercials on which listening tests were made: DGG, FYL, GID, G5SW, HJO, KDKA, KFYR, KKZ, TIR, VE9GW, WAZ, WEAF, WQP, W2XAD, XDA.

From the mass of heterogeneous data submitted, involving so many variables, the problem of digesting and condensing the results so as to put them in a form for simple presentation can well be appreciated. Some of the variables encountered are time, location and extent of eclipse at transmitter, location and extent of eclipse at receiver, frequency of signal, transmission distance, power of transmitter, intensity of received signal, method of measuring intensity, and the ever present personal equation including such items as possible errors in time recording, operation of receiver at optimum sensitivity, and the estimation of intensity of signal where the R system was employed. Not the least confusing factor was the failure of many to report the system of time used.

The scheme finally adopted was to show typical

graphs of change in intensity of the received signal plotted against time for several conditions in each of the amateur bands. The sub-conditions are the extent of the eclipse over the transmission path, including areas having 90–100% totality, 75–90%, 50–75%, and less than 50%; and the transmission distance, including local, an intermediate distance where skip effect would be expected under night conditions, and longer distances up to the maximum range of the band.

The intensity changes are reported as decibels above or below a normal level. Where the R system was used a change in one number, such as from R8 to R7, or R5 to R6, was considered as a change in received energy of four decibels. The time ordinate shown is minutes before and after totality (or maximum extent of eclipse) considering the mean time of the maximum over the transmission path. For convenience of those desiring to compare the time with their own observations,

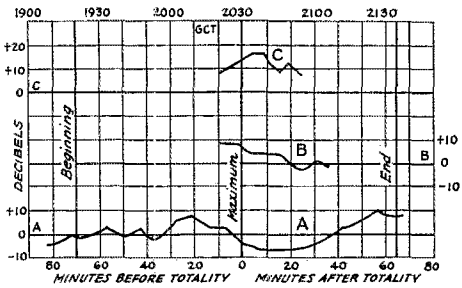


FIG. 2 — 3500-KC. BAND, 75 TO 90% TOTALITY
A — Less than 50 miles.
B — 50 to 200 miles.
C — 200 to 500 miles.

the Greenwich Civil Time is also shown on the basis of totality occurring at 2030 G.C.T. (3:30 p.m. E.S.T.). At Douglas Hill, Maine, the computed times of the various phases of the eclipse were: first contact, 1920; second contact, 2028:47; third contact, 2030:24; and fourth contact, 2134 G.C.T.

All the data were examined and found to agree very well with the typical curves shown with only scattered conflictions. A few unusual transmissions were reported but they must be considered as freaks which so often occur in short-wave work, their occurrence being increased by the greater number of stations on the air during the daytime and the extra vigilance of receiving operators.

GENERAL CONDITIONS

Cosmic data supplied by "Ursigram" * messages showed that the 24 hours from 1400 G.C.T., August 31st, to 1400 G.C.T., September 1st, was classed as a quiet day as far as terrestrial magnetism data was concerned. The preceding two days were days of moderate magnetic disturbances, and August 27th and 28th were classed as days of great disturbances. One sun spot, with a Wolf number of about 8 was visible on August 31st and passed from the face of the sun on September 2nd. Prior to this, two sun spot groups had crossed the face of the sun beginning on August 23rd and reaching a maximum Wolf number of about 24 on August 26th. The aurora displays for the days in proximity to August 31st were faint to moderate as observed at College, Alaska. Parenthetically it might be mentioned that the writer has observed on days when brilliant aurora were visible in New England, accompanied by violent magnetic storms, that the skip distance was greatly reduced; 15-meter signals were heard at a distance of 100 miles that under normal conditions were never heard.

The weather maps for the period of the eclipse showed a tropical storm progressing inland in the Gulf States. Rain occurred in the northeastern states, the Gulf States, and the Middle West. No pronounced isotherms were indicated for the eastern part of the country but temperatures were mostly above normal. Pressure was low in the Gulf States and high in the Middle West. There was no sharp pressure gradient in any part of the country except in the vicinity of the tropical disturbance. Scattered thunderstorms occurred over most of the eastern half of the United States on the afternoon of August 31st. The western half was mostly clear with temperatures below normal.

From these data it may be reasonably concluded that on August 31st radio transmission should have been approximately normal and that marked variations from normal could be associated with the solar eclipse. From the many local thunderstorms irregularities in QRN could be expected. Those observers who mentioned the fact confirmed that transmission was normal on August 30th, August 31st, and September 1st.

160-METER BAND

As is usual during the daytime, there was little activity on this band and too few reports were received to allow drawing any conclusions regarding any change in conditions during the eclipse.

80-METER BAND

A great many reports were received on observations in the 80-meter band and since the transmission distance was generally such as to include an area of nearly uniform solar coverage, the results are easier to interpret. Although both phone and c.w. stations were on the air with test signals, the best data received were on the c.w. signals since with the equipment usually accessible to the amateur it is more difficult to measure variations in intensity of modulated carriers. The curves shown are for c.w. signals but are equally applicable to phone transmissions.

* See *QST*, Sept. 1932, p. 35.

Fig. 1 gives results in the area of 90 to 100% totality, all reports on reception of W1BZI. The A curves are typical of results at less than 50 miles, or little more than local distance. The solid line is reception reported by W1AGA at a distance of 40 miles in the zone of 99% totality, while the dotted line indicates the readings of W1AFC at 38 miles, also in the 99% zone but in a different direction from the transmitter. These show irregular "sunset" effects or fading in the early and late stages but with a general rise in level at totality. The dotted line indicates a decided peak lagging behind totality.

The B curve records the results obtained by W1ASP at a distance of 75 miles in a zone of 96% totality, and is typical of results from 50 to 200 miles. This distance, which at night would be expected to show skip on 80 meters, also shows irregular "sunset" fading but a greater rise in signal strength than the A curves. Lagging about a minute behind totality was a pronounced dip or tendency towards skip, for a short interval. This was followed by a large increase after which the signal rapidly returned to normal volume.

The C curves show results typifying distances greater than 200 miles which is about the maximum distance possible within the limit of 90% totality which was set for Fig. 1. The full line is the data reported by W3DZ and W3CL, the dotted line those of W3QL, all in zone of 93% totality and about 225 miles from the transmitter. Tendency towards skip is shown in the early phases and after totality. Signal strength was considerably raised over normal, in this case peaking about three minutes before totality without a corresponding peak following. The observations for the dotted line were not taken at as frequent intervals as for the other curves and hence show less irregularity.

Fig. 2 indicates results in the area of 75 to 90% totality for the 80-meter band. Curve A was submitted by W9BN on reception of W9AN at a distance of 44 miles with the eclipse about 76% total. Irregular fading is shown with peaks of increased signal before and after the maximum of eclipse and a pronounced dip between the two peaks, all lagging behind the visible eclipse.

Curve B is a composite of several reports at distances of 50 to 200 miles. It appears to be somewhat parallel to A. Curve C was submitted by W3AAJ on reception of W1APJ at a distance of 390 miles and the eclipse about 90% mean totality over the path. Signal strength is well above normal and peaks about seven minutes after the maximum coverage of the sun. In addition to this curve C, in the 75 to 90% zone R6 signals were reported at 600 miles, R3 at 800 miles, and DX of 1000 miles at the greatest extent of the eclipse.

In the area of 50 to 75% totality, insufficient data were obtained to admit of plotting, but the individual reports showed results similar to the 75–90% zone but to a lesser degree. On the Pacific coast where the eclipse was about 15% total conditions on the 80 meter band were reported as normal.

40-METER BAND

On the 40-meter band skip distance was such that very few stations at distances less than 200 miles came through at any time of the day. W1EKL could not be heard at W1EAO a distance of 200 miles at the beginning of their schedule at 1400 G.C.T. (9 a.m. E.S.T.) with the aid of a frequency meter set on 7150 kc. After listening 3 hours, W1ATW (220 miles) heard W1EKL for five minutes at 1700 G.C.T., when he was lost and heard no more. In areas of greater than 75% totality what few stations that were heard at distances up to about 200 miles fell out completely near the maximum of the eclipse.

In Fig. 3 is shown results obtained in the range of 200 to 1000 miles for various degrees of eclipse.

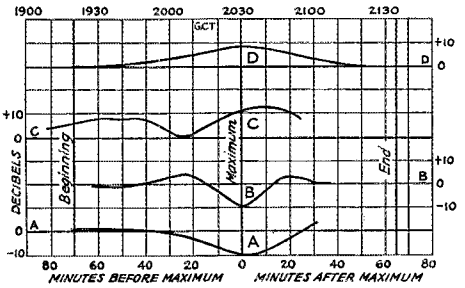


FIG. 3 — 7000-KC. BAND, 200 TO 1000 MILES
A — 90 to 100% totality.
B — 75 to 90% totality.
C — 50 to 75% totality.
D — 15% totality.

These curves are composite averaged results from a great many observers and show general tendencies omitting specific fading irregularities. Curve A shows that near the path of totality signal strength was reduced, the maximum reduction peaking approximately with totality. As indicated in curve B for regions of 75 to 90% totality, signals at first increased and then decreased rapidly at the maximum eclipse coverage. Reverse effects were observed as the eclipse receded.

In regions of 50 to 75% eclipse, curve C, there was at first a slight increase in signal strength as the eclipse came on. This was followed by a dip to somewhat below normal and then a maximum increase was observed lagging somewhat behind the maximum of the visible eclipse. On the Pacific coast with 15% totality, curve D, signals gradually increased with the partial eclipse and then slowly decreased again to normal.

Distance reception of greater than 1000 miles was also reported in the region of about 50% totality at various times throughout the progress of the eclipse.

20-METER BAND

The distance of transmission on the 20-meter band is such that widely different extent of eclipse was present at the transmitter and receiver. In addition, contacts with European stations were over a sunset area as well as the path of the eclipse. No attempt has been made to differentiate between the results secured depending upon whether the transmitter or receiver was at the location of maximum eclipse effect. Undoubtedly a difference does exist, but there was insufficient data to make comparisons.

Many reported on reception of high-powered commercial stations with varying results. W1AFC

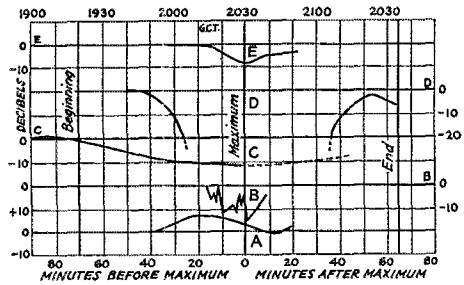


FIG. 4 — 14,000-KC. BAND

A — 71/20% totality, 1400 miles.
B — Night/95% totality, 4000 miles.
C — 96/50% totality, 2000–3000 miles.
D — 99/65% totality, 1230 miles.
E — 79% totality, 1 mile.

at 99% totality reported no change in DGG on 22 meters from 1830 to 2125 G.C.T. (1:30–4:25 p.m. E.S.T.). W1VF at 100% totality reported a noticeable increase in signals from GID on 24 meters during totality. In the region of 70% totality W9ABS kept watch on WAZ, XDA, WQP, KKZ and HJO. From 1400 to 1800 G.C.T. the eastern stations were R5–R7 with marked variations, west coast stations R6 and steady. At 1800 the east coast stations rose to R8 very steady, but at 1900 dropped out altogether. The west coast stations increased to a very loud signal. From other sources we learn that the Canadian Marconi Company found no definite change in 22- to 37-meter transatlantic reception.

Fig. 4, curve A, shows the variation in reception of XDA (about 20% totality) on 20.7 meters by Charles E. Dewey, Jr., in Jefferson City, Mo. (71% totality), at a distance of about 1400 miles. Between these two points there was a time difference of about 20 minutes in the phases of the eclipse. It would have been interesting if these observations had been continued for at least an additional hour, as in all probability another peak intensity would have been found.

It should be pointed out that the commercial channels are operated at a high power level and at a frequency that will give reliable communication under the prevailing conditions. On the other hand, amateur contacts on this band (and quite often in other bands) are with comparatively low power, and more often than not are in the "fringe" zone of possible contact. It is to be expected then that small differences in the transmission path would produce a much greater change on amateur transmissions than upon commercial channels.

European observers of American amateur signals, as well as observations from midatlantic ocean reported rapid irregular fading together with mushiness of note caused by high-speed fading during the period at and near totality. Curve B of Fig. 4 shows reception of W2CJM by ON4AU, a distance of about 4000 miles from darkness to a region of 95% totality and crossing the path of totality. A general reduction in signal strength peaking with the eclipse is noted.

Curve C indicates composite results of observations taken by G2JA at sea, 1560 miles east southeast of New York and in a region of about 96% totality on the opposite side of the path of totality from the United States. At this point sunset occurred at about 2120 G.C.T. Stations received were at distances of 2000 to 3000 miles down to about 50% totality. This curve shows a regular decrease in signal strength peaking with the visual eclipse. Results toward the end of the period were partially obscured by twilight effects, and this part of the curve is given as a dotted line.

In the United States, W1AZQ, in the path of totality, reported European signals fading out and 6th district coming in at 2000 G.C.T. During totality at 2030 G.C.T., only the 5th district could be heard and with diminished strength. From 2105 to 2145 G.C.T. only 4th, 5th districts and Cuba were audible. At 2200 G.C.T. reception was again near normal with the return of European signals until they disappeared for the night at 2215 G.C.T.

Curve D shows reception of W1HE (99% totality) by W9AOG (65% totality) at a distance of 1230 miles. Signals entirely disappeared for about one hour, the center of this effect lagging about five minutes behind the visible eclipse.

The results, curve E, obtained by W9RS and W9EGE are quite interesting and show that even in the region of 79% totality the reception of a one-watt oscillator over a distance of one mile was considerably reduced.

LONGER WAVES

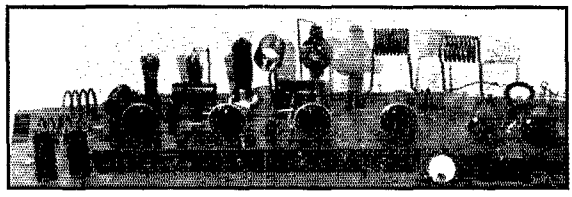
On the broadcast band reports indicated that at distances less than 100 miles night conditions of mushiness and fading were found during the maximum of the eclipse. At distances of 200 miles near the path of totality, no changes were observed. Reception of broadcast stations from four to five hundred miles distant faded completely or nearly out in various parts of the country, the maximum effect peaking with the time of totality.

W1AFC found no change in the intensity of FYL on 19,000 meters other than the normal daily change.

QRN

A great many amateurs reported changes in QRN and were led to the belief that the eclipse had left a high static level. A few reported no QRN for the entire period.

As mentioned earlier, during the period of the eclipse, there were a great many areas of scattered thunderstorms throughout the country, most of which occurred on the afternoon of eclipse day. Analysis of the QRN reports show that without exception those who reported bad QRN were near a local thunderstorm area, and those who reported no QRN were at a considerable distance from one. Of course the greater transmission range during the eclipse also carried the static disturbances over greater distances. So it appears that the eclipse can not be blamed for QRN conditions on August 31st.



THE TRANSMITTER USED AT W1EKL, LOCATED AT DOUGLAS HILL, ME., WITH SID McCUSKEY, W8DRP, IN CHARGE

The output stage used an 860 with 300 watts input. Although 3500-kc. operation was first contemplated, a frequency of 7150 kc. gave better signal strength at Cleveland both day and night.

OTHER RESULTS

Since the eclipse, the results of some other observation parties have become available and should be mentioned briefly in passing.

The Bureau of Standards reported that measurements made near Washington, D. C., showed that the critical frequency for the E region of the Kennelly-Heavyside Layer decreased about 1000 kc. during the eclipse, lagging behind phases of the eclipse by approximately five minutes.

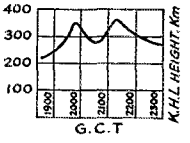


FIG. 5 — DISTURBANCE IN F REGION OF KENNELLY-HEAVYSIDE LAYER DURING ECLIPSE, 3942 AND 4540 KC.

Observations made in Canada under the direction of Drs. Henderson and Rose showed distinct losses in ionization of both reflecting layers E and F regions during the period of the optical eclipse and no indications of a corpuscular eclipse.

Messrs. Kenrick, Mimno, Pickard, and Wang gave a preliminary report to the Boston Section of the I.R.E. on results of automatic photographic records of echo lag behind ground signals. On 1640 kc. no echoes were observed until ten minutes after totality (2040 G.C.T.), when the E layer appeared at about 110 km. height. This persisted until 2110, when it disappeared and the F layer came in at 250 km. and remained until 2130. No reflections were then observed until 2145 when the E layer returned until 2200, when it vanished and was replaced by the F layer which remained until sunset. On 3942 and 4542 kc. no E layer reflections were observed, but there was an F layer disturbance of double-humped character coinciding with the visible eclipse. Because of its close resemblance to some of the amateur results of reception, the curve showing this disturbance is reproduced in Fig. 5.

And now after complete absence of any indication of a corpuscular eclipse, there appears an article in the public press stating that Dr. E. F. W. Alexanderson of the General Electric, by using a frequency of 8655 kc. between Schenectady, N. Y., and Conway, N. H., had observed almost complete disappearance of signals two hours previous to the optical eclipse, and attributes it to a corpuscular eclipse. Although at this writing complete information on his tests are not available, and full comment must be withheld, it is difficult to accept his conclusions when it is remembered that his tests were conducted in a region supposedly outside the zone of a corpuscular eclipse.

CONCLUSIONS

At the outset it was stated that one of the questions which it was hoped to settle by means of radio observations during the eclipse was whether the ionization of the upper atmosphere was caused by ultra-violet radiation from the sun or by neutral particles shot off at a much slower velocity.

Amateur transmission was most certainly effected during the eclipse, the maximum effect in general coinciding with totality of visible eclipse or lagging a few minutes behind it. In all cases conditions approached those of night, the nearness of approach depending upon the extent of the eclipse in the region. The return to normal conditions seemed to be somewhat slower than the onset of the disturbance. On 40 and 80 meters, double humped intensity curves were observed similar in shape to the variation in the F layer height found by the Harvard group of observers.

This would seem to prove definitely that ultra-violet light, or some radiation travelling with the speed of light, is mainly responsible for the

ionization of the upper atmosphere. The findings of scientific observers show that there were changes in the E and F regions of the Kennelly-Heavyside Layer coincident with the optical eclipse.

As regards a corpuscular eclipse, and the acceptance of the opposing theory, very few observations were taken by amateurs which could be used as a basis for a definite conclusion. What observations were made over a sufficient length of time and over the probable path of the corpuscular eclipse failed to show any effect of such an eclipse, if there was one, on transmissions in the amateur bands or on commercial frequencies close to amateur assignments.

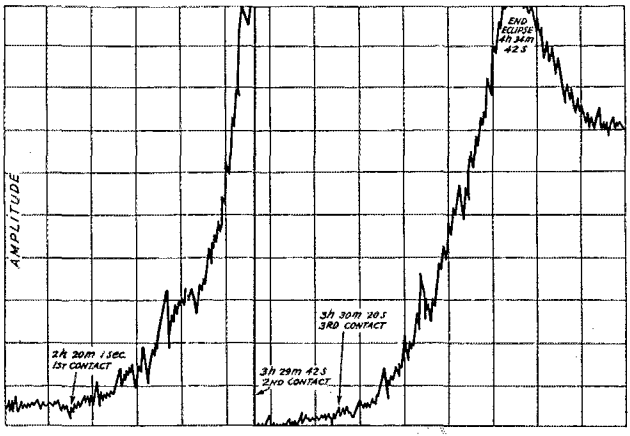


FIG. 6 — THE GRAPHICAL RECORDING OF W1EKL'S 7150-KC. SIGNALS MADE AT CASE SCHOOL SHOWS A TREMENDOUS RISE IN SIGNAL STRENGTH BETWEEN FIRST CONTACT AND TOTALITY, THE RECORDER PEN GOING CLEAR OFF THE SHEET AT TOTALITY

A few seconds later the signal dropped down to the background level and was inaudible for some 15 minutes. Then it gradually built up and reached a second peak just before the moon's shadow passed away, the pen again going off the sheet, with the second peak lasting somewhat longer than the first. The signals then gradually dropped to normal level. The eclipse was over.

On the other hand, if Dr. Alexanderson's results are accepted then it would appear that the effect of the corpuscular eclipse was quite small as compared to the optical eclipse and that the stream of corpuscles or neutral electrons from the sun exert only a small influence on the ionization of the upper atmosphere. So, for the time being, at least, we still have the two theories with us.

Many amateurs expressed a regret that it would be a long time before they could experience the enjoyment of noting the effects of solar eclipses on radio transmission. The results reported here show quite well that it is not necessary to be in the path of totality to observe a "radio eclipse." Wherever the eclipse may be, the ever resourceful amateur can select frequencies and stations upon which he can make satisfactory and convincing observations. Let's continue to make radio studies of coming eclipses.

The Delta Division Convention

WHEN 45% of the delegates reach a convention the night before it begins, it means only one thing — *success*. That's exactly what happened at the Delta Division Convention held in Pine Bluff, Arkansas, October 15th and 16th, under the auspices of the Tri-State Radio Association. With representatives from every part of the Division, "hamming" was carried through the wee small hours by those early arrivals. Everyone was ready for the morning session, Saturday, when Director Hill opened the convention and turned same over to Ray Arledge, W5SI, the chairman, who immediately started things going. The speakers at the different sessions were: "Bill" Joy, Sales Engineer, National Carbon Co.; Frank M. Davis, University of Arkansas, talking on "Class B Amplifiers" and Nat Scott of Scott Coil & Transformer, who showed some of the apparatus so well known to many amateurs. Radio Inspector DuTreil came from New Orleans and gave examinations. Twenty-two took advantage of the opportunity, and all passed. Several contests were held during the two days and worthwhile prizes won. The Naval Reserve was unusually well represented with Lt.-Commander J. J. Wilkinson in charge, and we can visualize a good unit in that section soon. The Communications Department activities were well covered by Bodker, SCM, Mississippi; Velte of Arkansas and Route Manager Presley. Two trips of interest were made to the Arkansas Power & Light Plant and the airport club house where W5SI is located, and what a location! Then came the Banquet! The guests of honor were Mayor Holderness who gave the freedom of the city to all the delegates; Treasurer A. A. Hebert, A.R.R.L., who spoke on the Madrid developments and Lt.-Commander J. J. Wilkinson, U.S.N.R., with Director Hill acting as toastmaster. Chairman Arledge and W. F. Fortune, President of the Tri-State Radio Association, made the closing speeches. We almost forgot the dance Saturday evening and the YL's who came to the rescue of those terpsichorean hams without partners. All aboard for Memphis in 1933! — *A. A. H.*

W9FFH reports this gem from a bargain sheet: "These resistances are guaranteed not to develop noise or open circuits in *us*." No doubt of it!

QRR, 1932

Amateur Emergency Work During the Past Year

By Clinton B. DeSoto*

FOR fourteen years the signal QRR or its equivalent has flashed on amateur waves whenever storm, flood or other emergency disrupted established lines of communication. 1932 saw amateur radio stepping into the breach to link an emergency area with the outer world on two major and a number of minor occasions.

When southwest Texas[1] went grimly to work to relieve distress and restore order in the Guadelupe Valley area stricken by flood on July 1st, where nine lives were lost and over one million dollars' property damage done, amateurs of that region were just beginning to relax from their three-day vigil in which they had successfully bridged the total gap in all wire communications, leaping the isolation created by the raging waters.

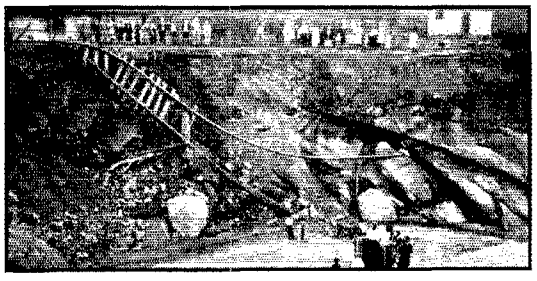
From the headwaters of the Guadelupe River up in the hill country northeast of San Antonio had come sweeping the most disastrous flood ever to wreak havoc on the peaceful upper Guadelupe Valley. The heavy rains throughout western Texas during the last days of June had suddenly augmented the mountain stream by a 45-foot rise, the highest in history, washing out bridges, sweeping away hundreds of summer resort cottages, inundating great areas, leaving thousands homeless and without food and shelter.

By nine o'clock the evening of July 1st, all telephone and telegraph lines had gone out. The total lack of communications and transportation facilities virtually isolated the region from the entire outer world. In accordance with the established procedure of amateur radio in emergencies, the three amateurs in Kerrville, Texas, hard-hit summer resort town of 4500, where more than thirty houses were swept from their foundations, met at the home of one of them, Eugene T. Butt, W5BSF, early Saturday morning. By 8:45 a.m. W5BSF was on the air calling "QRR San Antonio," with Clarence T. Lawson, W5BKE, as chief operator, assisted by Jimmy Mitchell, W5BKZ, and J. O. McKnight, W5MT, a visiting amateur from San Augustine.

It was not San Antonio that was first worked, however, but W5WL, operated by E. M. Flake, in Houston. First definite news of the extent of the flood damage was flashed to the world over this circuit, and a dozen messages from groups of stranded refugees reporting their safety to relatives and friends were transmitted.

THE LONG WATCH BEGINS

During the succeeding three days W5BSF remained on the air continuously except for late night and early morning hours, when skip conditions prevented local working. Until the wire lines were able to resume service at 6 p.m. on July 4th, Lawson and his assistant operators remained at the key, eating their meals at the operating table when necessary, and maintaining constant contact with Houston, San Antonio and Richmond, Texas.



SEARCHING FOR BODIES IN THE PATH OF THE CALIFORNIA FLOOD

Many unknown itinerants aboard the freight trains were among those buried alive in tombs of rock and sand. Several bodies were found 19 miles from where the wall of water engulfed them.

A total of 111 distress messages were sent and 25 received and delivered, not including notices to the broadcasting stations and several long communications to the press, for whom amateur radio performed an invaluable service in the Texas emergency. Most of the messages were from individuals concerning their safety and property losses. Many of these constituted the Western Union file of telegrams, relayed by amateur radio from W5BSF, and turned over to the wire line at Houston and San Antonio.

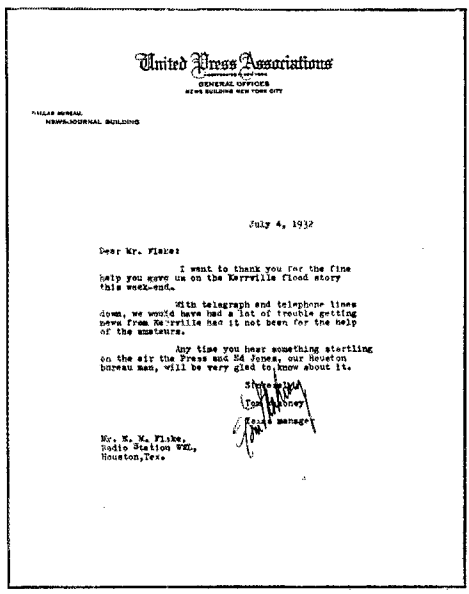
Pleas from the chapter commander of the Disabled American Veterans of the World War for department and state aid to the American Legion tubercular camp, Legion, where nearly fifty families of disabled war veterans were driven from their homes, destitute, were accorded prompt action, Governor Sterling ordering tents and bedding from National Guard headquarters to be sent the veterans. This service alone was of enormous importance in the relief work to follow.

*Assistant to the Secretary, A.R.R.L.

[1] A.R.R.L. Weekly News Service.

Counsellors from the many boys' camps in the flooded region either swam the swollen streams, crossed in canoes or trekked the weary miles over the hills to Kerrville, and had Butt send messages to the outside world that all was well. In practically every instance, according to W5BSF, answers to these messages were received within thirty minutes after they were sent.

While the bulk of the message traffic was with Houston, San Antonio amateurs performed excellent service in delivering press dispatches and radiograms to persons in their locality. Horace E. Biddy, W5MN, and L. J. Stickney, W5OW-WLJ, at Fort Sam Houston, were active



United Press Associations

GENERAL OFFICES

July 4, 1932

Dear Mr. Fiske:

I want to thank you for the fine help you gave us on the Kerrville flood story this week-end.

With telegraph and telephone lines down, we would have had a lot of trouble getting news from Kerrville had it not been for the help of the amateurs.

Any time you hear something startling on the air the Press and Ed Jones, our Houston bureau man, will be very glad to know about it.

Mr. H. M. Fiske,
Radio Station WXL,
Houston, Tex.

A PRIMARY PHASE OF AMATEUR RADIO'S EMERGENCY RESPONSIBILITY IS IN TRANSMITTING AUTHENTIC INFORMATION TO THE PRESS

In most disasters of recent years amateurs have supplied the waiting world through the newspapers with news that could not otherwise be obtained. See September, 1931, QST, page 34.

in this accomplishment. Along with W5WL at Houston, the most indefatigable operator was H. N. Darst, W5AEA, at Richmond, Texas, who remained on watch during the entire three-day period until wire lines were again run through.

STORMY FLORIDA

Floridians[2] have learned to fear storms and, when one threatens, everyone in the probable storm area endeavors to protect himself in every possible way. The Red Cross organizes emergency crews; the railroads coöperate in moving thousands from the expected path of the hurricane; and people turn to their local amateur stations for the communication they have learned to expect.

With the wind and rain and ever-present threat of terrible disaster, the feeling preceding an approaching storm is always grave. During the past summer several such storms have passed over and around Florida, and in each instance the Florida 'phones did Herculean work, staying on duty night after night, gathering data on wind velocity, barometer readings, predictions and reports, and maintaining 15-minute schedules hour after hour.

On August 29th, from the first warning of the major storm that began that day, hundreds of dread-filled people gathered at the Lake Worth Radio Club, anxiously awaiting news of the storm, coming through W4AWO. With W4ACZ acting as emergency control station at Orlando, a net covering the entire state was in continuous operation, including W4DU, W4MF, W4WM, W4WS, W4UH, W4BN, W4ANR, W4CJ, W4KM and W4BAM. While W4DU kept the big 'phones of the north from QRMing the band, the remaining stations kept in touch with practically every vital point in Florida. W4BN was completely equipped with emergency power supply if necessity for its use arose, representing the thoroughness with which Florida amateurs prepared for all emergency work they might be called on to do.

A LOST CHINESE

Charlie Wong,[3] cook at a Kasaan (Alaska) fish cannery, caused a considerable flurry on the northwest coast last April when he disappeared from his post in the packing plant kitchen. The woe felt by friends and patrons upon being deprived of their customary flapjacks became real alarm when Charlie's skiff was found adrift and empty. K7AAC, of Quadra, Alaska, broadcast an appeal for help, requesting that the U. S. Coast Guard find the cannery chef and return him to his empty-stomached clientele.

The message was picked up by Edward Lloyd, W7AIE, at the Moran Junior College, Bainbridge Island, Washington, and relayed by telephone to Coast Guard headquarters at Seattle. Not long afterwards a damp but happy Charlie was discovered some 20 miles from Kasaan and returned to the cannery. Next day's flapjacks were reported as being up to par.

WIRES DOWN IN PENNSYLVANIA

When a heavy snowfall in the mountainous regions of Pennsylvania[4] broke wire lines between many of the principal cities, interrupting communications with consequent detriment to private and business correspondence, Pennsylvania amateurs coöperated with the South Penn Power Co., West Penn Power Co., Western Union and

[2] Ray Atkinson, W4NN, S.C.M. East Florida.

[3] "West Coast Fisheries," George Roger Chute, Editor.

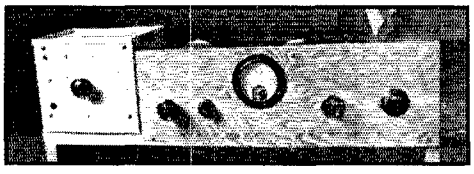
[4] A.R.R.L. Communications Department.

other agencies. A. W. McAuly, W8CEO, Oakmont; Pennsylvania State College, W8YA, and other stations in Altoona, Harrisburg and Philadelphia aided in this work. The Army-Amateur net in this as well as in five other similar instances during the past year did some fine, well organized relaying.

THE CALIFORNIA DISASTER

One of the worst and most tragic storms in the history of California[6] began on the night of September 30th, after a day of heavy rainfall, the storm loosing its fury in the high Sierras sixty miles southeast of Bakersfield and washing down through the old mountain mining town of Tehachapi, through Tehachapi Pass, down Caliente Creek and Canyon — a 45-foot wall of water, accompanied by boulders falling like hail from the many landslides, wiping out six villages, crushing houses like match boxes and killing countless people. Two monster locomotives and their trailing box cars were handled like toys by the terrific torrent, one engine being buried out of sight under the silt of the creek bed. Two million dollars' damage resulted, and a path of death twenty miles long became the ghastly aftermath.

Rising to the emergency, Bakersfield amateurs, realizing that all communications lines were down when meagre reports began to trickle in the morning after the disaster, quickly organized their forces. Fred H. Hicks, W6EJU-W6ZZU; George Dryden, W6DQV; Ernest Roux, W6EXO; Joseph R. Meloan, W6CGM-W9BPX and James L. Mattly, W6FJI, composed the emergency amateur radio expedition which, led by the California Highway Patrol, began the trek into the mountain flood area. With their portable equipment stowed away in three cars, they skidded and plunged through the flood waters about Arvin until they reached the mountains, high and by then comparatively dry, the cloudburst waters having spread over the lower portions of the San Joaquin Valley. Twenty miles of mountain road brought them to the center of the storm area at Keene and Woodford. No sooner did the Bakersfield amateurs arrive than they were greeted by a heavy downpour of rain and the promise of another storm. Hastily they removed their portable ham stations to dry quarters in the large Keene Sanitarium, which lay directly in the path of the disaster but escaped by a stroke of good fortune, the water having passed by its very doors.



THE CRYSTAL-CONTROLLED PORTABLE USED BY W6CGM IN THE CALIFORNIA FLOOD WORK

Using a dynamotor for portable d.c. supply, this transmitter stood an acid test by giving satisfactory signals with the storage battery so run down that the input was less than 3 watts.

Meanwhile, in Bakersfield, Norman McLaughlin at his c.c. W6GEG, the U.S.N.R. Radio Club station W6KE; Frank Cuevas of W6AOA; Cleetis Armistead, W6ENH; Bill Neihaus, W6BRP and Leroy Hicks, W6FKV, arranged a continuous watch for as long as the emergency might demand.

ONE OF THE LOCOMOTIVES BURIED IN THE SILT OF CALIENTE CREEK BED DURING THE RECENT CALIFORNIA FLOOD

WORK BEGINS

At 2 p.m. the emergency crew dived into the installation of W6CGM's crystal portable, fighting the twin difficulties of inadequate antenna facilities and poor location, being situated in a canyon encompassed by high ore-laden mountains. It was not until late that evening that skip lifted sufficiently to permit two-way contact with Bakersfield. Schedules were arranged for the next morning, with W6FKV keeping an all night watch at W6KE for the Keene signals in the event of further disaster. By morning signals were better, and real emergency flood traffic was handled. Priceless service was rendered rescue parties, railroad officials and others.

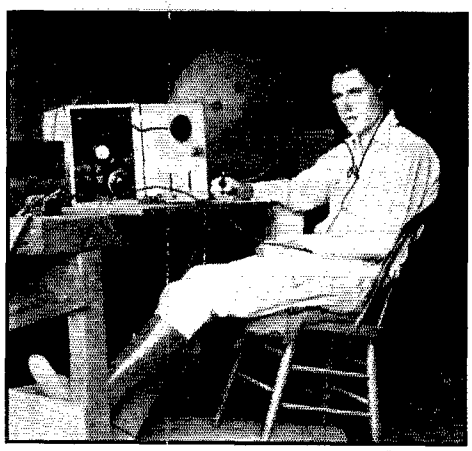
A.c. power being available at Keene that noon, new equipment was brought up from Bakersfield, and with this and a new semi-vertical Hertz, really good signals were being reported in Bakersfield by 5:30 p.m. An army of rescue men, linesmen, police, news reporters and cameramen were now at the scene of the disaster, while overhead droned the motors of airplanes making photographic aerial maps for various national news services.

With the coming of dawn, the best report of the entire expedition was received from W6FGE, 130 miles distant, after a bare spot in the antenna

[6] Joseph R. Meloan, W6CGM-W9BPX-KERN, Bakersfield, Calif.

had been cleared from a tree, the signals being R7-8 at Baldwin Park, Calif. A few minutes thereafter, W6GEG was again QSO'ed, and notified that communication lines would soon be into Keene. Sole remaining members of the emergency expedition was the isolated duo which then requested that someone be sent to bring them home. While waiting for transportation, the portable equipment was packed, all possible late news secured, wreckage viewed and pictures taken, and the emergency work was ended.

The new mining town of Centreville,[6] in the wilds of British Columbia, is 300 miles from the nearest railway, and there are no means of communication or travel to it except by horseback. When an American miner named Crawford was badly injured by a premature explosion in the mine on July 26th, it looked like certain death for him. Not until the presence among the camp crew of George H. Latham, VE5DZ, was discovered did hope appear, for Latham had with him his portable outfit using a '71A as oscillator. He was able to make immediate contact with VE5FG,



RUDY REAR, W6GKB, OPERATING A TYPICAL SET-UP OF FOREST SERVICE RADIO GEAR

Operating on a frequency of 3440 kc., crystal-controlled, these transmitters have call signals beginning with "SP" and ending with a numeral. This equipment had the call SP26.

a distance of some 600 miles, who wired the police at Victoria asking that a doctor be rushed by plane to the injured man. While waiting for the plane, VE5FG gave instructions on caring for the accident victim. Constant contact was maintained between the two stations for 16 hours, while the plane flew from Carcross, Yukon, to Atlin. There the pilot found weather conditions too bad to proceed for several hours, but finally reached the mine and the injured man was taken to Whitehorse, where he recovered.

[6] Ray Keitges, VE4DT, R.M. Alberta; King Cavalsky, VE5AL, S.C.M. British Columbia.

FIGHTING FOREST FIRES

While not strictly an affair of amateurs coping with emergency, the radio work during the big Matilija forest fire[7] in Ventura and Santa Barbara counties, Calif., which began September 7th, is of importance because it is the first big fire where radio has been relied upon entirely for communications, and because the participating operators were all active amateurs especially enlisted for this fire.

The Matilija fire, during which 220,000 acres were burned in five watersheds, was not brought under complete control until September 20th. During nine days of this period, radio communication was maintained between four portable stations in as many camps on the fire line, and from 10 to 30 air-line miles apart. The base station was located at the Ojai ranger station, from which all instructions concerning the fire fighting emanated.

The five amateurs operating the portable stations were Gordon McAdams, W6BFM; Ben Brown, W6BZF (relieved after three days by Frank Lloyd, W6ENJ); Edward Cain, W6GIE and Harry Williamson, W6CWI. The base station was operated by Rudy Rear, W6GKB. The safety and lives of several hundreds of men were entirely dependent upon the radio communication provided by these amateurs.

The combined transmitter-receivers used 2-volt tubes and were crystal-controlled, with c.w. or voice optional. While the equipment operated highly satisfactorily, it was learned that higher-power transmitters were necessary for use in such large fires because of the adverse conditions created by the blanketing effect of the heavy gasses and smoke, and the terrific static caused by the rushes of cold air against hot.

EMERGENCY APPARATUS CONSIDERATIONS

This experience emphasizes the abnormal difficulties encountered in emergency work, where inadequate facilities for antenna location and transmitter operation and frequent lack of power conspire with unnatural atmospheric conditions to make satisfactory working almost impossible. The California crew, working in their recent flood disaster, were forced to the conclusion that emergency portable equipment must be at least equal to the average home installation, that it must be able to work from a.c. or d.c. with any tubes from '30's to '10's and that the antenna must be right and a regular part of the equipment; haphazard emergency antennas are frequently worse than useless. Even a loop will ordinarily work better than the expedient of hopefully tying onto a convenient BCL antenna. Current-fed antennas (the ones we used to call antenna-counterpoise systems) are favored for flexibility and certain radiation.

(Continued on page 48)

[7] Rudy Rear, W6GKB, Santa Barbara, Calif.

Modulating the Screen-Grid R.F. Amplifier*

How It Behaves With Grid, Screen-Grid and Plate Modulation

In Two Parts—Part II

By H. A. Robinson, W3LW**

MODULATION characteristics for screen-grid modulation under a number of conditions are shown in Fig. 7.[1] Here again there is a linear portion the extent of which, and hence the modulating capability, is greatly influenced by the ratio of r.f. excitation to control grid

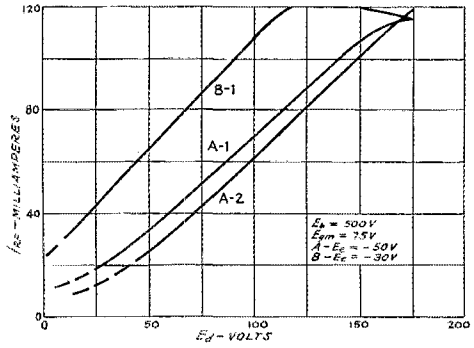


FIG. 7 — SCREEN-GRID MODULATION CHARACTERISTICS

Here again limited modulation capability prevails, with critical adjustment necessary.

bias voltage, as well as by the tuned circuit loading. The flattening of the characteristic at the lower end, as in the case with grid modulation, indicate the impossibility of securing complete modulation (100%) without excessive distortion.

SCREEN-GRID MODULATION

The oscillograms of Fig. 8 show typical results obtained with this method of modulation. The audio voltage was coupled in at J_2 (Fig. 1). Trace 1 shows only a slight degree of distortion in conformity with the modulation characteristic A-2 of Fig. 7 (heavy load) while Trace 2 shows all the distorting effects expected from a characteristic

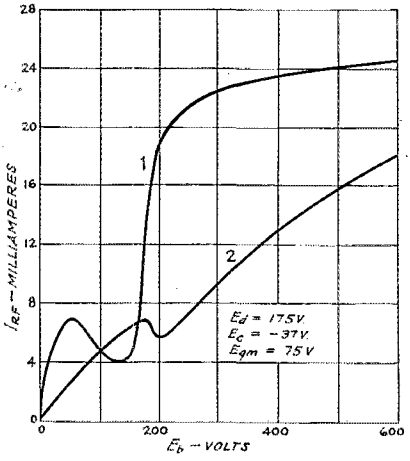


FIG. 9 — CHARACTERISTIC FOR PLATE MODULATION WITH THE SCREEN VOLTAGE CONSTANT

Secondary emission from the plate is responsible for the pronounced dips.

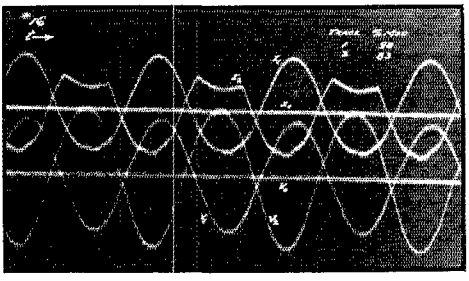


FIG. 8 — OSCILLOGRAMS FOR SCREEN-GRID MODULATION

Trace 1 shows but slight distortion and agrees with A2 of Fig. 7, while Trace 2 shows distorting effects agreeing with B1 of Fig. 7.

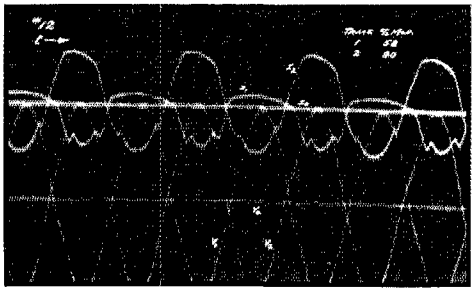


FIG. 10 — OSCILLOGRAM FOR PLATE MODULATION WITH FIXED SCREEN VOLTAGE, SHOWING THE DISTORTION HUMPS RESULTING FROM SECONDARY EMISSION

This system of modulation is not recommended.

* Abridgment of graduate thesis, Moore School of Electrical Engineering, University of Pennsylvania.

** Silver Lake Farm, Willow Grove, Pa.

[1] Figs. 7, 9, 11, 13 are reprinted by permission from a paper by the same author in *Proc. I.R.E.*, Jan. 1932, pages 131–160, "An Experimental Study of the Tetrode as a Modulated R.F. Amplifier."

of the form of B-1 of this figure (lightly loaded tuned circuit). This method of modulation permits a modulation capability of the order of 75% without excessive distortion. This degree of modulation can be secured by a modulating voltage of 50 volts r.m.s. across an equivalent impedance of the order of 50,000 ohms. This method is also rather critical in adjustment and is greatly influenced by all the factors previously mentioned in considering grid modulation.

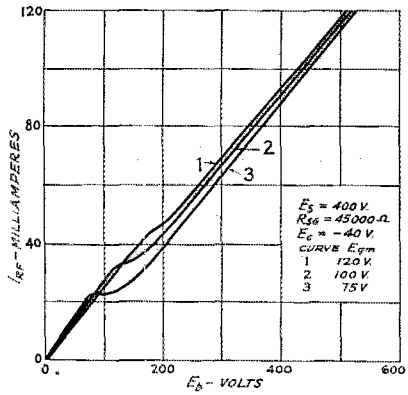


FIG. 11 — CHARACTERISTIC FOR PLATE MODULATION WITH SERIES RESISTOR IN SCREEN-GRID CIRCUIT

There is a noticeable improvement in linearity.

PLATE MODULATION

When the screen-grid tube is plate modulated in the usual manner there is very serious distortion from secondary emission whenever the plate potential falls near or below the screen potential during the audio cycle. This distortion is particularly pronounced where the screen is maintained at a nearly constant d.c. potential (E_d) with no series resistor in the screen-grid circuit (R_{sg} in Fig. 1 shorted). The typical modulation characteristics of Fig. 9 show the pronounced dip resulting from excessive secondary emission. The improvement of Curve 2 over Curve 1 results from the high output tuned circuit impedance (lightly loaded tank). However, in amateur practice, where the output circuit is usually heavily loaded in order to obtain the maximum power output, the characteristic of Curve 1 would be obtained. It can be seen that if the d.c. plate voltage were selected at 300 volts, with a modulation characteristic similar to that of Curve 1, there would be no positive modulation loops because of the flattening of the curve. Such a con-

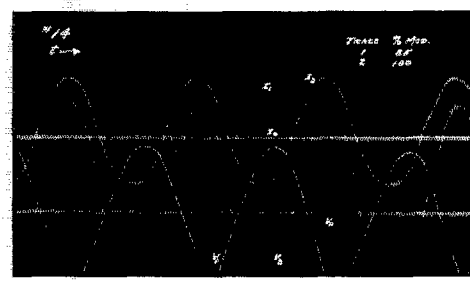


FIG. 12 — THE OSCILLOGRAMS FOR PLATE MODULATION WITH SERIES S.G. RESISTOR ILLUSTRATE A MARKED REDUCTION IN SECONDARY EMISSION EFFECTS

TABLE I

DATA ON OSCILLOGRAMS

No.	*Trace*	E_{gm} *(Volts)*	E_b *(Volts)*	$-E_c$ *(Volts)*	E_d *(Volts)*	E_m *(Volts)*	E_m $E_{d.c.}$ *%*	*% Mod.*
17 (Fig. 6)	0	80	500	40	125	0	0	0
	1	"	"	"	"	40	100	97
	2	"	"	"	"	64	160	150
16 (Fig. 8)	0	90	500	50	100	0	0	0
	1	"	"	"	"	100	100	90
	2	"	"	"	125	125	100	83
12 (Fig. 10)	0	55	300	30	125	0	0	0
	1	"	"	"	"	300	100	58
	2	100	"	"	"	300	100	90
14 (Fig. 12)	0	125	300	40	300	0	0	0
	1	"	"	"	"	300	100	85
	2	"	500	"	500	500	100	100
			R_{sg} =	45,000 ohms				
23 (Fig. 14)	0	75	300	30	*	0	0	0
	1	"	"	"	*	226	75	76
	2	"	"	"	*	300	100	100
	3	"	"	"	*	340	113	108
			R_{sg} =	45,000 ohms				

* Screen grid supplied with modulated voltage through R_{sg}. E_{gm}, r.f. excitation voltage; E_b, plate supply voltage; $-E_c$, negative control-grid bias; E_d, screen-grid voltage; E_m, modulating signal voltage; $E_{d.c.}$, mean (d.c.) voltage on electrode modulated (control grid, screen grid, plate).

dition is clearly apparent in the oscillogram of Fig. 10, Trace 1. Trace 2 shows a decided improvement as expected from Curve 2, though the peculiar humps due to the secondary emission are still noticeable. Because of this distortion and the rather critical adjustments this method of modulation seems to have but little practical value.

The distorting effects of this secondary emission can be greatly reduced by the use of a series resistor (R_{sg} of Fig. 1) in the screen-grid circuit. At the point of the modulating cycle at which the plate potential falls near the screen potential, the increased screen-grid current flowing through this resistor increases the potential drop and the screen voltage falls. The modulation characteristics obtained by this method show a very great improvement in linearity as evidenced by the typical curves of Fig. 11. The oscillograms of Fig. 12 also show but little distortion even for complete modulation. The series resistor (R_{sg}) is not critical and 40,000 to 50,000 ohms seems to be satisfactory with this type of tube. The modulation characteristic is affected by the ratio of excitation to control grid bias voltage (Fig. 11) as well as by the load circuit impedance, thus requiring careful adjustment for best results.

PLATE AND SCREEN-GRID MODULATION

The distortion of the modulation characteristic resulting from secondary emission can be completely eliminated and the modulation characteristic made practically linear without the critical adjustments characterizing all the previous modulation methods, by introducing the modulating signal in both the screen-grid and plate circuits. Thus, when the plate voltage falls during the modulating cycle, the screen voltage falls in the same proportion. This is accomplished in the schematic diagram of Fig. 1 by throwing Switch 2 to connect the screen-grid return through the resistor R_{sg} (45,000 ohms) to the high side of the modulation input at jack J_3. The modulation characteristics of Fig. 13 indicate how successful this modulation method

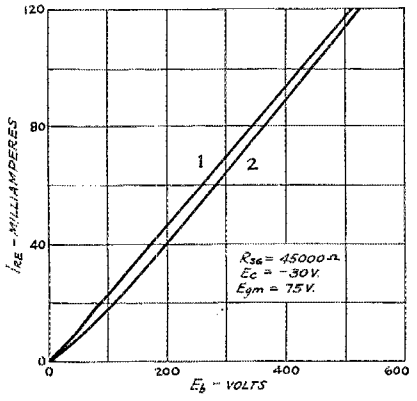


FIG. 13 — CHARACTERISTIC FOR COMBINED PLATE AND SCREEN-GRID MODULATION

The linear region actually extends beyond the highest plate voltage shown, almost to 1000 volts. Complete modulation with maximum output is obtainable with this system.

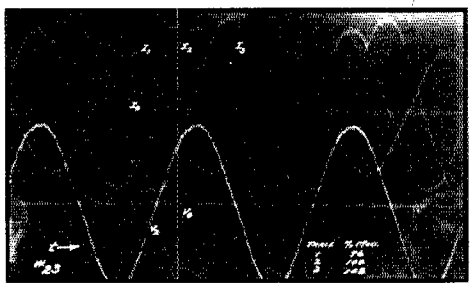


FIG. 14 — OSCILLOGRAMS FOR COMBINED PLATE AND SCREEN-GRID MODULATION SHOW THAT COMPLETE 100% MODULATION AT A PLATE VOLTAGE OF 500 IS ESSENTIALLY DISTORTIONLESS

The screen-grid tube performs like a perfectly neutralized triode.

has been in eliminating distortion. Curve 1 was obtained with a light load on the output tuned circuit, while Curve 2 showed a negligible change when this circuit was loaded. As these curves tend to indicate, the linear region of the modulation characteristics extend to plate voltages higher than those available for measurement. This linear region extends nearly to 1000 volts and oscillograms for complete modulation with the d.c. operating voltage at 500 and a 500-volt peak modulating signal, show a negligible degree of distortion. The presence of a higher harmonic in the modulating signal input in the oscillograms of Fig. 14 and the faithfulness of reproduction in the modulated output are noteworthy. Trace 3 of this oscillogram shows the decided flattening of the negative loops when the carrier is over-modulated.

This method of modulating the screen-grid tube proved to be, by far, the most satisfactory of all those discussed from the standpoint of flexibility, freedom from distortion, ease of adjustment for optimum performance, and maximum power output with complete modulation. Under these conditions the screen-grid tube performs in a manner similar to a perfectly neutralized triode and the r.f. power output, efficiency and audio input for complete modulation are substantially the same as for a modulated triode with the same output load. It is hoped that this modulation system and method of determining the performance of the modulated stage from the r.f. modulation characteristic will find wide-spread application in amateur 'phone practice.

MODULATION METHODS AND POWER OUTPUT

In comparing the various methods of modulation the criterion of r.f. power output should be

(Continued on page 48)

Tunable Hum

Its Cause, Effect and Elimination

By F. S. Dellenbaugh, Jr.*

RECTIFIERS using gas or vapor, such as the Tungar type and the now prevalent mercury vapor tubes of all kinds, frequently cause parasitic oscillations in the associated circuits. These oscillations usually consist of damped waves of uncertain frequency which can be tuned in at various points on the dial of a receiving set, and which frequently interfere with the tune of the transmitter and crawl out along the power supply wires to make general trouble in the neighborhood.

This tunable hum is frequently confused with straight a.c. ripple in the transmitter note. Since it is caused by the same power supply frequency, it will have the same apparent pitch. It can be readily distinguished, however, by anyone who has once heard it. Too little filter produces a low smooth hum which sounds more like an organ note, while tunable hum will have a raw jagged sound very similar to that of old style spark transmitters and of the electric ignition for oil furnaces.

THE FIRST CAUSE OF TUNABLE HUM

Vapor rectifiers require more voltage to start conduction than to keep the current flowing. In other words, a tube may start on 20 to 25 volts but, as soon as it is started, only about 15 volts

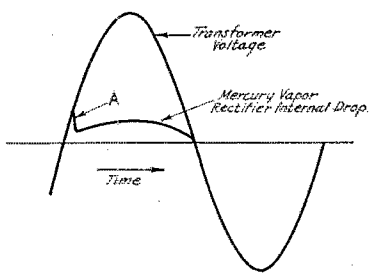


FIG. 1 — INTERNAL DROP IN VAPOR RECTIFIER

Main curve shows transformer voltage. Smaller curve shows internal drop of vapor tube exaggerated. Point A is breakdown of tube where conduction starts. Average internal drop of most commercial mercury vapor tubes is about 15 volts.

drop is required to keep it conducting. Since the rectifier has to operate every half cycle, the sudden change from starting to running voltage drop occurs with twice the supply line frequency. The effect is like negative resistance; and wherever negative resistance is present in a circuit, oscillations are apt to occur. It also can be considered as a sudden release of voltage which is applied to the circuit and causes a small but violent transient surge, which oscillates at various frequencies depending upon the circuit and tube constants.

Fig. 1 shows an exaggerated sketch of the voltage drop across such a rectifier during the conducting half wave. The sudden drop in voltage will be seen at "A." Fig. 2 shows an oscillogram actually taken of one form of tunable hum. This picture was taken with a cathode ray oscillograph. The plate current of one rectifier tube moved the spot in one direction and the output voltage moved the spot in the other direction. Fig. 3 shows an analysis of how this curve is built up. It is a little difficult to interpret, but it illustrates the parasitic oscillations very well. The whole sweep of the curve horizontally from left to right at (a) to (b) occurs in a very small fraction of a second, since the current passing through the tube rises from zero to some definite value in a small fraction of a cycle. The frequency of the oscillations shown in Fig. 2 is about 50 kc. Other oscillograms of similar nature have been obtained with different circuits, showing such oscillations varying from a few thousand cycles to radio frequency, too high to estimate accurately or photograph.

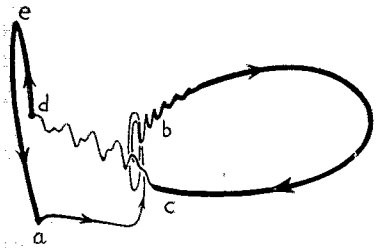


FIG. 2 — OSCILLOGRAM SHOWING PARASITIC OSCILLATIONS CAUSING TUNABLE HUM

Oscillations due to start of tube occur in range (a) to (b). Oscillations due to shut off of tube occur in range (c) to (d). For explanation of curve see Fig. 3. The looping effect and distortion are due to stray fields affecting the oscillograph.

THE SECOND CAUSE OF TUNABLE HUM

With some tubes and some circuits the rectifier tube will suddenly stop conducting when current decreases to a very small value. This is known as "shut off," and the writer knows of several cases

*Delta Mfg. Co., 39 Osborne St., Cambridge, Mass.

in large power supplies where defective tubes exaggerated this effect, causing breakdown of highly insulated transformers. In one case enough voltage was produced to jump across an air gap nearly one inch long, which means 15,000 to 20,000 volts. If current is flowing through an inductance, even a very small current, and the rectifier tube suddenly shuts off, the remaining energy in the inductance *must* be dissipated somewhere. This causes an inductive "kick" in voltage in some part of the circuit and breakdown occurs. In the case just cited there was enough energy present and the tubes were operating so badly that the voltage rose to a destructive point. The same effect may take place in a minor way and small violent transients will occur which oscillate at frequencies, controlled by the circuit constants, which may be in the radio range. This is illustrated by the oscillation from (c) to (d) in Fig. 2.

PREVENTION OF TUNABLE HUM

The best action is to eliminate the hum at the source. A large enough first choke in the filter

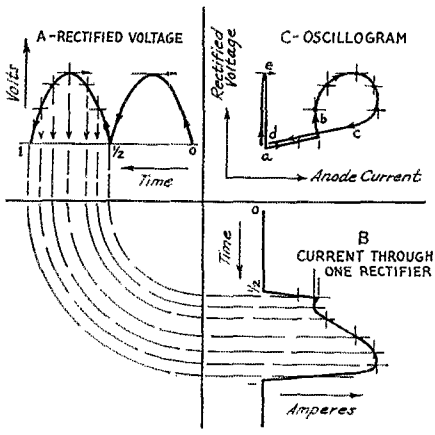


FIG. 3 — CONSTRUCTION ILLUSTRATING OSCILLOGRAM OF FIG. 2

The circuit consists of the usual single-phase full-wave rectifier with two tubes such as Type '66. The output is connected to the customary filter with choke input. The rectified voltage at the terminals of the tubes is shown in A. The rectified current through one tube is shown at B. Both of these values vary with time. The voltage A is connected to oscillograph plates moving the spot vertically in oscillogram C. The current B is run through a coil on the oscillograph which moves the spot magnetically from left to right in oscillogram C. The dotted lines from voltage A through arcs in left-hand corner to current B identify similar points of time. The intersection of current and voltage values occurring at each of these points of time identify points on oscillogram C.

From time "zero" to time "one-half" no current was passed through the rectifier and the oscillogram merely goes up and back again, tracing the curve d–e–a. The rectifier now suddenly breaks down, the current rises rapidly and the oscillogram traces the curve a–b. This is followed by rise of both current and voltage, causing the loop b–c. At this point the rectifier shuts off and the cycle is completed by the line c–d.

The lines a–b and c–d occur in a very small fraction of a cycle. The actual time was approximately 0.0003 seconds.

The parasitic oscillations shown in Fig. 2 have been omitted from this construction for simplicity.

circuit is one of the first major improvements to eliminate this disturbance. If the first choke is above the critical value[1] the current is handed from tube to tube by the choke action and the tube starting voltage is supplied by energy from

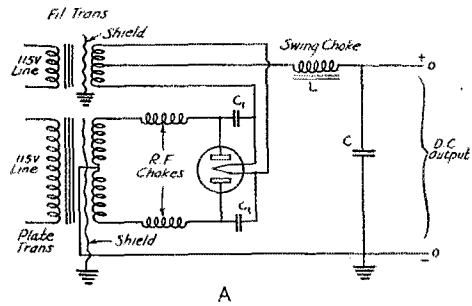


FIG. 4A — SINGLE-PHASE FULL-WAVE RECTIFIER PROTECTED FOR TUNABLE HUM

Input choke of swing type shown at L and buffer condensers shown at C_1–C_1 tend to eliminate this hum. The buffer condensers may be connected to any part of the filament circuit, but short leads connected directly to tube terminals are preferable.

The r.f. chokes must be installed in each plate lead in the bridge and are not as effective if placed in transformer terminals only. Transformer shields should be provided on all filament transformers and the main power transformer.

the choke rather than by power from the transformer. The choke inductance should swing with current drawn so that it is always greater than the critical inductance.

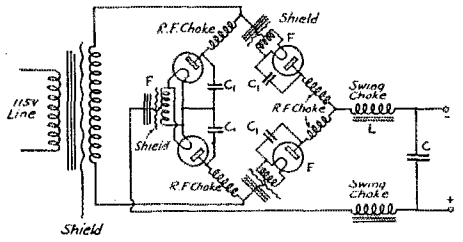
Some tunable hum may still remain, particularly with bridge type rectifiers. The next step is to make another fundamental attack and introduce buffer condensers as shown in Fig. 4. These condensers act like springs. They are charged up during a rise of voltage and, when the tube breaks down, the charge is released through the tube, supplying the current surge necessary during the sudden drop between starting and running voltage. As a rule fairly small condensers will either completely eliminate or very materially reduce any residual hum. This was the old stunt used with B-eliminators employing gaseous rectifiers of the Raytheon type and for low voltages of 150- to 200-volt condensers of 0.1 μfd. were used. Since the energy stored in a condenser increases with the square of the voltage, every time the voltage is doubled the size of condenser can be reduced to one quarter; if the rectified voltage is 1500 to 2000 volts (increased to 10 times), a condenser of about 0.001 μfd. should be satisfactory.

FURTHER CONTROL OF TUNABLE HUM

If an adequate first choke and proper buffer condensers still leave some tunable hum, further steps will prevent it from getting into annoying parts of the circuit. Radio-frequency chokes in

[1] See Dellenbaugh and Quimby articles on chokes and filters, *QST*, Feb., March and April, 1932.

each rectifier anode lead will help materially in this case. Because these chokes deal with the tunable hum frequency and not the transmitter frequency, they must be of considerably larger size than those used in the transmitter circuit. (See Fig. 4.)



B

FIG. 4B — SINGLE-PHASE BRIDGE-TYPE RECTIFIER PROTECTED FOR TUNABLE HUM

The filter input choke and buffer condensers serve the same purpose as in Fig. 4A. The buffer condensers should be connected directly to the rectifier plate at one end. The other end may be connected to any part of the filament circuit, but again short leads directly to tube terminals are preferable.

The r.f. chokes must be installed in each plate lead in the bridge and are not as effective if placed in transformer terminals only. Transformer shields should be provided on all filament transformers and the main power transformer.

A very important feature which cannot readily be adopted by the amateur, but should be furnished by manufacturers of power supply equipment, consists of a shield between the primary and secondary of all transformers operating the rectifier. This shield should have a separate terminal which can be grounded at the best spot to prevent tunable hum being carried back into the supply line and causing interferences to all other radio sets in the neighborhood, as well as to your own.

Modulating the S.G. R.F. Amplifier

(Continued from page 45)

considered as well as modulation capability. Theoretically there is only one limitation affecting every modulation method, in the case of amplitude modulation. This is the well-known relation that for complete modulation the *peak* modulated r.f. power output rises to four times the unmodulated carrier output. Primarily this maximum power output (modulation peaks) is limited by the type of tube, plate and r.f. excitation voltages employed and is not a characteristic of the modulation method.

In practice, however, in order to operate the modulated r.f. amplifier over the linear portion of the modulation characteristic, the conditions for minimum distortion, a departure from the optimum conditions (from the standpoint of power output) of excitation, bias and plate voltage, becomes necessary with the accompanying reduction in maximum power output. This departure from optimum power conditions is usually greatest in the case of grid modulation methods[2] and least in the case of simultaneous modulation of both screen grid and plate. Because of the very wide variation of output loads, and available excitation in amateur practice, it is practically impossible to predetermine specific limits or the variation in power output resulting with the respective modulation methods.

[2] The tube rating and power output relationship for the case of a grid-modulated triode amplifier has been described by Isberg, "Making Practical Use of Grid-Bias Modulation," *QST*, August, 1932. — EDITOR.

QRR, 1932

(Continued from page 42)

1715 kc. seems to be the best band, with 3500 kc. regarded as second. We add that 56 mc. would ordinarily have possibilities, but might be found too subject to local terrain conditions. Crystal-control is highly desirable, particularly under bad physical conditions, a single tube and a power crystal being adequate. The old familiar TNT or Hartley will perform workably, however, if the antenna is decently tight and steady, and the power supply not too deplorable. High power is not necessary; efficiency is. This means, to repeat, good, workable antenna systems. With that combination, plus a lot of hard work, a modicum of ability, and a little good luck, successful achievement seems assured.

A New Handbook

WE FEEL like celebrating!

As we write this we are just about completing the job of rewriting and reillustrating the Handbook. For three months or more the Hq. staff has been doing work on parts of it — in as much time as could be spared from other duties. For the past few weeks the pressure has been increasing because we had to have it ready January 1st. Now, with a final flourish of midnight oil and strenuous effort, it's ready for the printer's tender ministrations.

The tenth edition of the Radio Amateur's Handbook is done and — well — with pardonable pride — we think it's pretty hot.

We built new gear, took new pictures, wrote new descriptions, condensed here and expanded there, covered all the many changes which have occurred during 1932, tried to bring everything right up to date from stem to stern.

The "10th Edition" comes pretty near to being a whole new book. It must be that momentous changes took place in Amateur Radio in 1932. At least the new Handbook looks it.

for the EXPERIMENTER

Detectors with Screen-Grid Feed-Back

RECENT *QST* articles emphasizing the instability of the usual regenerative detector have concentrated attention on doing something to improve matters, particularly in the case of the popular screen-grid detector. Identically the same scheme has been proposed almost simultaneously by three contributors, W2AIF, W8DYY and W5TR. Its essentials are shown in Fig. 1, recognizable as a sort of adaptation of the electron-coupled oscillator as it was

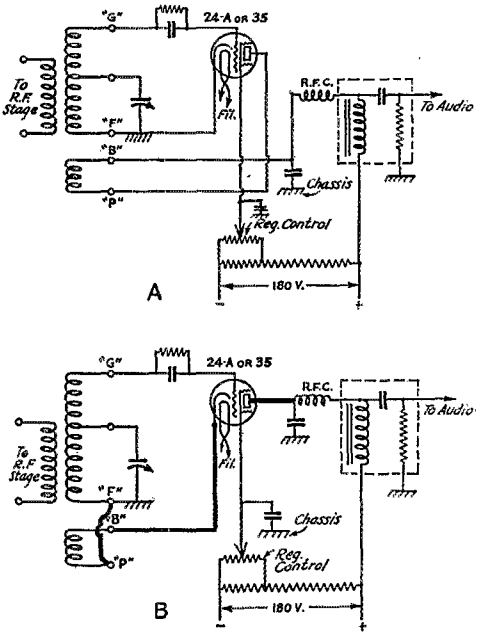


FIG. 1 — DETECTOR WITH SCREEN-GRID FEED-BACK

A — the usual screen-grid regenerative detector; B — the revised circuit, with changes shown in heavy lines. Circuit constants are usual, although in B a smaller tickler may be used.

first given in "Stabilizing Superhets" April, 1932, *QST*. The diagrams show how the usual screen-grid regenerative detector, as used in the National SW3, SW5, etc., can be re-wired to use it. Advantages claimed are more stable oscillation, less blocking, reduced background hiss, smoother regeneration control and just as good, if not better, sensitivity. Incidentally, the idea is not unlike the scheme of using the tickler in the screen-grid circuit, as it was described by Howard Cassler in December, 1931, *QST*. The essential difference is that here the screen is at ground r.f. potential and the cathode is "up in the air," whereas the screen was fed through a choke and the cathode was grounded in the older arrangement. Basically, however, both are the same breed.

Key-Click Preventer

In Fig. 2 is the diagram of a key-thump filter used by C. C. Richelieu, W9ARE, which has proved its effectiveness in a number of different instances. W9ARE has this to say about it:

"The system has been used at W9ARE during the past two years with never anything smaller than a 50-watt tube in the output stage, running with varied inputs of from 100 to 250 watts, and it is the only system that has worked out satisfactorily. I have also given this diagram to numerous hams throughout the Middle West and to the best of my knowledge it has never failed to accomplish its purpose. W8KE at Frankfort, Michigan, is the latest adopter, and reports that he has tried every system ever given in *QST* or the *Handbook* during the past three years without results and that this system actually eliminated all clicks and thumps.

"This filter will change the adjustment of one's transmitter slightly if placed at the transmitter proper with lengthy leads run from the transmitter to the operating desk. To eliminate this

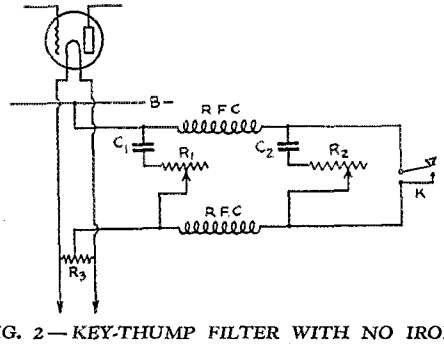


FIG. 2 — KEY-THUMP FILTER WITH NO IRON-CORE CHOKES

RFC — 150 turns of No. 28 d.c.c. on 1¼-inch form.
C1 — .5μfd. (must be rated to stand full plate voltage).
C2 — .006-μfd. mica condenser.
R1 — 2000-ohm wire-wound variable resistor.
R2 — 50,000-ohm variable resistor, any type.
R3 — Filament center-tap resistor (may be c.t. of filament transformer).

drawback the filter should be placed on the operating desk right at the key, where it will have an appreciable effect on the transmitter adjustment. Also, the C_2 capacity can be increased on certain transmitters with marked improvement — all the way from .006 μfd. up to 1 and even 2 μfd. Considerable arcing at the key contacts will result from the larger condenser, but this arcing will have no effect in a BCL receiver because it is blocked by the r.f. chokes. In some cases the larger type condenser works much better.

A Novel Class B Modulator

A Class B modulator using an ordinary power transformer for coupling between the modulator and Class C amplifier is being used successfully by W5ANB. The primary of the transformer is connected in series with the secondary, as shown in Fig. 3, thereby becoming an auto-transformer. This gives about the right impedance match,

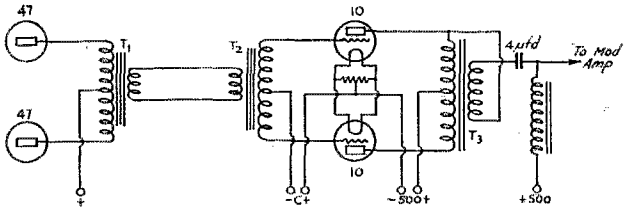


FIG. 3 — CLASS B MODULATOR WITH AUTO-TRANSFORMER COUPLING

T1 — Transformer designed for coupling a pair of Type 47 tubes to a 15-ohm load.
T2 — Transformer designed for coupling a pair of Type 45 tubes to a 15-ohm load.
T3 — Power transformer with center-tapped 1200-volt winding and 110-volt winding.

provided the transformer primary is poled correctly with respect to the secondary. The connections should be reversed when giving the system a trial to see which way gives the better audio power transfer. It is advisable to feed the modulated amplifier through a choke as shown in preference to running the Class C plate current through the coupling transformer because otherwise one side of the transformer will carry all the d.c. for the modulated amplifier and the system is likely to be thrown off balance.

The coupling between the driver stage and the modulator also is of interest because it utilizes transformers originally designed for a different use and offers the opportunity of using a transmission line between the driver and modulator.

A Neutralizing Kink

By H. B. Churchill, W2ZC

GENERALLY the greatest trouble experienced in high-power amplifiers after neutralization is from continual breakdown of the neutralizing condenser unless it is rated at twice the plate voltage or so. The following trick was hit upon at W2ZC and saved expensive neutralization condensers for the 500-watt stage and works beautifully.

The neutralizing condenser is connected to *preceding amplifier side* of the grid condenser, as shown in Fig. 4, instead of the old method of going directly to the grid. It is often common practice to run the last two stages from the same supply or at approximately the same voltage, and with this method the neutralizing condenser has no d.c. difference in potential across it. With the 852-204-A combination it is possible to use a neutralizing condenser of low breakdown voltage rating. With the old method such a combination required a 6000-volt neutralizing condenser at W2ZC to hold down the voltage.

As applied to smaller transmitters, for instance with a Type '10 feeding a 50-watter, this method is also a great saver. The 50-watter has 1000 volts on its neutralizing lead, while the '10 has perhaps 500 on its plate and the other side of the neutralizing condenser. Both these voltages are positive with respect to a common ground; hence the difference in potential across the neutralizing condenser is 1000–500, or 500 volts. A midget receiving condenser will do now instead of that big double-spaced affair.

Only one further consideration enters, and that can be quickly discounted. The grid coupling condenser is in series with the neutralizing condenser and therefore becomes part of the neutralizing capacity. If the grid condenser is the usual .002 or so, however, there will be very little effect on the setting of the neutralizing condenser (reciprocal sums, with large condenser in one fraction).

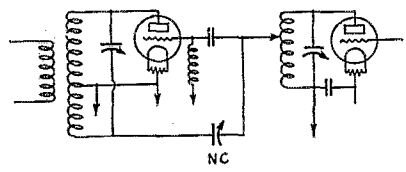


FIG. 4 — A NEUTRALIZING CIRCUIT WHICH MINIMIZES VOLTAGE BREAKDOWN

This has been a life-saver at W2ZC. For very high power as much as a 12,000-volt breakdown neutralizing condenser was needed at certain times. Now a very insignificant condenser sits serenely in the final stage and doesn't turn a hair.

Simple Method of Obtaining Blocking Voltage

BLOCKED-GRID keying is popular among amateurs, as the many ideas along this line published in *QST* prove. Here is another method of supplying the extra grid-bias voltage required by the system. It is contributed by Andy Hammerschmidt, W8EGZ.

The transformer *T* in Fig. 5 is a 3:1 audio transformer, 3:1 happening to be the ratio W8EGZ had on hand. Any ratio will be OK if the secondary voltage is high enough to block off the r.f. tube when the key is open. The rectifier is a 201-A with the grid and plate tied together; here again any type of rectifier will serve just as well. Condenser *C* has a capacity of one μfd., which is enough to keep the output voltage fairly constant. Ripple is of small consequence since the voltage from the "eliminator" is shorted out when the key is closed and therefore does not have a chance to get into the transmitter, hence an elaborate filter is unnecessary. W8EGZ uses a Bradleyohm variable resistor at *R*, which is in the circuit simply to prevent burning out the transformer when the key is closed. Anything in the neighborhood of several thousand ohms ought to be OK here. The blocking voltage with the key open will be something higher than the transformer ratio times the primary voltage; a 3:1 or higher-ratio transformer should be plenty to cut off a Type '10 or even higher-power tubes.

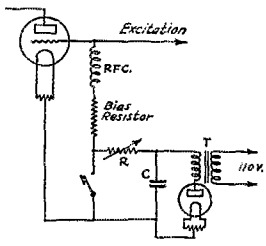


FIG. 5—INEXPENSIVE VOLTAGE SUPPLY FOR BLOCKED-GRID KEYING

Although W8EGZ uses leak bias on his amplifier, the scheme can be used with any kind of bias supply so long as the key can be put in the grid-bias lead.

Announcing—The Fifth International Relay Competition

Worldwide DX—All Hams Invited—To be held March 11–19, 1933—Contest is for two-way DX QSOS—All parts of the World—with U. S. A./Canada

SELF-ASSIGNED SERIAL NUMBERS

ANY amateur station, anywhere, can take part without advance entry. Each operator taking part will assign himself a distinctive three-numeral group and use this throughout the contest as the *first part* of each number exchanged. Numbers exchanged will have *six* figures, the latter three taken from the first half of each number-combination *received*. To confirm your first contact, since no numbers will then have been received, the six-figure group sent will consist of the three numbers which identify you in each log, followed by three "naughts."

AWARDS

Beautiful, new, bronze charms, inscribed with the call signal of the winners and bearing a design symbolic of amateur radio work will be awarded, (1) one in *each* remotely located country or territory — all hams using *the same prefix* compete for an award, and (2) in each of 64 A.R.R.L. Sections, mainland U. S. A. and Canada (see page 5, *QST*).

Since the special charm-awards will be made to the operator of the highest scoring station in each continental area, this puts all operators using the same prefix in competition with each other — and similarly each A.R.R.L. section-boundary circumscribes a competing group. DX-transmission characteristics being the same for all operators in each award-area, the chances of being a winner depend on operating ability and stations and are equally fair to all.

SCORING

Both the W/VE station, and the station in the remote locality receive *one point* when the W or VE serial number is acknowledged by the station in the remote locality. Each operator, similarly, may add *two points* further when a six-figure number (to U. S. A./Canada) is acknowledged or OKed by a W/VE station.

After all the individual scores have been added together, this sum, in the case of W or VE participants, is to be *multiplied by the number of countries or localities (prefixes) worked to give the total score.* In the same way, those taking part in other different countries (remote), *multiply their total of points by the number of U. S. and Canadian districts* they have succeeded in contacting, to give the total score. There are nine U. S. and five Canadian licensing areas making a possible multiplier of fourteen!

SEE FEBRUARY *QST*

Full details on the Fifth International Relay Competition will appear in February *QST*, with an example of contest work, and a log-score sheet such as required for reporting *your* DX. Don't miss the February issue, with full data on the March DX test in which you will want to take part. Those nifty bronze awards will be similar to the one shown, herewith. Shall we reserve one for you?

— *F. E. H.*

Strays

And here's a "bird" of a QSY: Not long ago W9DKD tuned up his transmitter on about 3560 kc. in the early part of the evening. Coming back three hours later, he let out a CQ and raised a chap who reported him on 3450 kc., although the transmitter hadn't been touched in the meantime. A clamor from the back yard attracted attention to the antenna, and there, upon investigation, were some fifty blackbirds roosting on sky-wire. After shooing off the birds W9DKD went back to the set and the frequency was back in the band again!

Election Returns—de W1MK

(Continued from page 26)

Amateurs" by your A.R.R.L. Headquarters station W1MK.

Continuous, cumulative, and rapid-fire telegraphic election returns — those who invited friends and families to "sit in" had the thrill of passing out the hottest dope from different sections of the country received "via amateur Radio." The "first" such transmission of election returns to all radio amateurs and . . . it was a great evening.

Some statistics:

W1MK frequencies — 3825 and 7002 kc. (500-watt set on each).
Date — November 8th–9th.
Time of transmission. 8 hours and 8 minutes (continuous) (following one hour "QST").
Telegraphic speed — Approximately 22 words per minute.
Election returns via Western Union service, from entire U. S. A.
Words transmitted — Estimated at 12,000.
Radio Operators at W1MK — RP EV DC FH.

The transmission was acknowledged from every U. S. district, and from points outside. Hams in practically every state in the United States heard and made use of the dispatches "to radio amateurs" sent by the A.R.R.L. In addition it is known that the returns were used in Alaska, Nova Scotia, Ontario, Jamaica, B. W. I., Balboa, C. Z., and by the U.S.S. *Bushnell*, off the west coast of Mexico.

It is impossible to quote from all of several scores of acknowledgments. Some representative comments are indicative of the wide general use and appreciation of this A.R.R.L. service, however:

"Congrats on the manner of handling the returns. 75% of our bulletin board reports were from your transmission. — NY1AA." "Much appreciated service. QSA5 R9 3825. — VE1AP." "Congrats — splendid service. — VE3GT." "Very easy to copy and returns FB until hurricane came our way. — VP2PA."

"On mill 7 p.m. until 1.45 a.m. Had figures to check back on which I could not get down from other services.— W1CJD." "Returns copied and successfully bulletined in Wilton Town Hall with help of another amateur. — W1CDX." "Very interesting. — W2NV." "Enjoyed the fast service. — W3BKQ." "FB. Looking forward to 1936. *Hi.* — W3BTE." "*Congregation at shack.* — W4ACB." "Returns copied here R6-8 all evening and still going strong when we hit hay 11.50 p.m. C.S.T. — W4PM." "Thanks for FB returns QSA4R7. — W5BMN." "Returns 100%. — W5EB." "Good signal 7002 kc. 7 p.m. to 9.30 p.m. P.S.T. Had messenger to take stuff to local newspaper office. Thanks for service. — W6QA." "Much pleased. The figures were much more interesting than the long-winded experting on b/c chains. Thanks for the service. — J. F. Hayes." "QSA3 R5 6.45 to 7.45 p.m. M.S.T. — W7COH." "Like private wire in home. — W8EIK." "Comment by statesmen most interesting. 12.45 summary solid. — W8GBK-CIL." "Appreciated enjoyable service. — W8DBX." "Had UP wire and half-hourly reports. Dope fm W1MK 1 to 1½ hrs. before that over our wire. Announced amateur data via P.A. *system with FB credit to amateurs.* — W8EVC." "St. Joseph Valley Amateur Radio Club (4 ops) posted bulletins in the window from your service. — W9AB." "Copied solid. — W9FUT." "QSA5 R6. — W9CDE." "Received returns 6 p.m. to midnight. — W9HK." "Sure appreciated. — W9BN." "You scooped the broadcasters on lots of the dope. FB operating. Fine code practise as well as first-hand information! — W9IYA." "75% your dope copied here 7002-R6 3825-R7-9. — W9ACE." "Dope FB, who furnished wrist oil? — W9FUT."

"The entire transmission was a success and sure fitted in with our scheme of things on board. Had planned to copy KUP, but when we heard you on 7002 we decided to copy you. Swell pdc note and steady signal. Started to copy you 5.30 p.m. zone plus 5 time. From then until 10 p.m. you were Strength 6, after that Strength 7. We were then in plus-6 time, off Acapulco, Mexico. Stuck to you until 12.30 plus-5 and as we had all dope we needed, knocked off copying. Thanks to you we got the latest and the first. — V. S. Wisniewski, NEFS, U.S.S. *Bushnell, en route* Balboa from Diego."

Also from "Uncle Sam's Last Frontier," Ketchikan, Alaska, "Claim long distance record copying your election returns on 3500 kc. R4 through QRN. 8.15 p.m. 135th meridian time. — R. J. Fox K7PQ."

"How" the service was conducted will be of possible interest to those who used it. Each man present at W1MK had his hands full every minute from the start at 5 p.m. to the finish at 2.39 a.m. E.S.T., November 9th. Western Union provided an operator to receive all information on the loop run into the station operating room. The A.R.R.L. operators alternated jobs, taking care of (1) necessary editing (2) actual transmission through operation of the tape perforator, and (3) the monitoring of both transmitters constantly to check for any errors, for insertion of the call signal at least once in every 15-minute period, and to correct any necessary adjustments to insure that both transmitters put out full power at all times on the stated frequencies. The monitoring operator also was ready to take up the transmission by hand should anything go wrong with the automatic equipment. Only once was this necessary for a five minute interval, when changing tape reels on the perforator. Also, using a "midget" in the power supply room, the service was checked up frequently to compare with broadcasting station reports to check the speed of one service against the other. Believe us, it was a busy evening — a "heat" and endurance run for station equipment, and personnel. We hope you liked the service.

— *F. E. H.*

CALLS HEARD

VE4BQ, John L. Green, 115 Furby St., Winnipeg, Manitoba

14-mc. band

cm2do cm2fa cm2fn cm2mm cm2vm cm2wa cm2wd cm2ww ct1aa ct1bg ct1ei ct2aw d4dgq ear26 ear96 ear121 ear136 ear185 f8ex f8fk f8vd f8wb f8pz g2ak g2bh g2bt g2dh g2ig g2vm g5bj g5hb g5iv g5ku g5sh g5sy g5qc g5vb g5vl g5vp g5yg g5yh g6ax g6cw g6hp g6py g6rb g6wy g6yk g6zr haf2g j1do j1ec j1ee j1eo j1ep j1er j2cb k5aa k5ad k6auq k6cmc k6ebr k7atf lu1ca lu3fn lu3oa lu5dj ny1aa ny1ab nedf on4au on4fe on4gn on4or pa6ll paqf py2bk py2bq py1ba rx1aa ti2fg ti2rc ti2tao ti3la x1aa x1h x1u x4j xl9a x1a1s vk2lz vo8an

7-mc. band

k6baz k6ebr k6fvl vk2gr vk2jk vk2jz vk2oc vk3ek vk3nm vk3tm vk3vp vk3zz vk5dq vk5mx vkwl vk5wr zl2ac zl2ci zl2cu zl2cx zl3bj zl4am

W5DB, W. C. Putnam, c/o Shell Pipe Line Corp., Box 637, McCamey, Texas

7000-kc. band

(February 15th to March 11th)

cm2bb cm2fc cm2fn cm2lc cm2mg cm2op cm3jm j1dv jhezj k4oap k6ai k6arb k6ccs k6cog k6cqz k6fab k6vg ti2fg ve3bf ve3bm ve3bv ve3hp ve3ll ve3tm ve3wx ve4ac ve4cb ve4ci ve4cp ve4el ve4gr ve5cv ve5fe ve5gb vk3ws vk3xi vk3zx w1co w1kc w1me w1mx w1af8 w1bss w1eph w1kug w2cl w2dm w2fa w2gw w2qp w2api w2bbq w2bcx w2bvx w2cjt w2cmo w2coe w2dcb w2dku w2tax w3fj w3gm w3anh w3apt w3avo w3bai w3bgl w3ccf w3cdk w3cfd w4abt w4agj w4aoy w4axc w4bbp w4eg w4ga w7afm w7agf w7aqn w7azi w7bac w7bdo w7btf w7fu w7hr w7iy w7jf w7kk w7kr w7mp w7oi w7ol w7pl w7ve w8abm w8ajr w8bfp w8bis w8bjp w8bjz w8bkp w8bms w8bsm w8byd w8cu w8cau w8cbe w8cir w8cnr w8cvu w8cwo w8cxr w8dco w8ded w8dmk w8edx w8efy w8ehz w8evi w8eys w8fap w8fey w8fgd w8fjk w8fny w8fym w8gec w8jo w8ll w8sgw w8uv x1aa x1ax x1ia x1n x9a zl1ck zl1cm zl2ab zl2bx zl2cl zl3cc zl4ap zu1b sfza

W1BO, Malcolm Bruce, 9 North St., Plymouth, Mass.

7000-kc. band

(Heard between April 16th and May 15th)

cm2jt cm2rz cm2wd cm5of cn8mj ct1bx ct2ae ear16 ear96 ear98 ear104 ear116 ear126 ear185 ear196 ear200 ear201 ear227 ear228 earfl earmr f8xf gnrm g5cv hk1z k4aan k4bu k5ad pa0gh pa0go pa0of sm7rv vp2ja zl3cc zs2a

W8GFF, A. S. Krispinsky, 712 Mabel Ave., Youngstown, Ohio

w6acl w6ads w6af w6ahp w6ahq w6air w6aiw w6akb w6akf w6aky w6al w6alt w6alu w6am w6amc w6amd w6amo w6ann w6anq w6anx w6any w6aoc w6aor w6apd w6apg w6aph w6apj w6aqp w6ass w6asw w6asv w6auv w6auy w6avf w6avj w6avv w6awo w6awp w6axi w6axm w6axn w6axv w6azx w6bam w6bax w6bbc w6bbz w6bdp w6bfa w6bfl w6bgm w6bh w6bhe w6bht w6bim w6bke w6bkm w6bls w6blx w6blz w6bme w6bmk w6bnk w6bnl w6boq w6bow w6bq w6bqo w6bqp w6bqy w6bre w6bri w6brw w6bsj w6bss w6bsw w6bth w6buo w6buw w6bvc w6bxg w6bxl w6by w6byj w6byq w6bys w6bz w6bze w6caf w6cap w6car w6cav w6cbi w6cce w6ccx w6cdv w6ceo w6cfl w6cgn w6cho w6ciq w6cix w6ckj w6cko w6cxq w6clo w6clp w6cmt w6cnb w6cno w6cow w6cpe w6cqq w6cri w6crl w6cub w6cuq w6cuu w6cvf w6cvv w6cvw w6cww w6cxo w6cyd w6cye w6czk w6czq w6czx w6bdb w6dce w6dcv w6dcy w6ddd w6dep w6der w6dfs w6dgu w6dhf w6dfo w6dgm w6di w6dis w6dip w6diq w6djc w6duw w6dkh w6dkv w6dli w6dns w6drf w6doo w6dow w6dps w6dtd w6dub w6dve w6dww w6dwy w6dxd w6dye w6dgu w6eav w6ebo w6ebv w6ecn w6edv w6eea w6efc w6eft w6ega w6ehp w6ehy w6ei w6eii w6eiw w6eja w6ejm w6ejz w6ek w6elu w6epb w6epg w6eq w6erm w6err w6ert w6etg w6etl w6evl w6evq w6euk w6eul w6euv w6ewt w6eww w6exa w6exq w6eyf w6fal w6fas w6fba w6fbn w6fce w6fck w6fcl w6fco w6fde w6feb w6fff w6ffm w6fft w6ffw w6fgu w6fkf w6fme w6fmx w6fni w6fow w6fpe w6fps w6fqv w6fqw w6fqy w6frz w6fsf w6ft w6ftt w6fuj w6fus w6fuy w6fwg w6fwn w6gfi w6kh w6li w6lo w6ly w6nw w6od w6og w6oj w6pw w6sf w6sj w6sn w6tc w6tm w6tn w6ts w6ty w6vs w6vg w6yb w6ybb w6zp w7acq w7afe w7aho w7aho w7aka w7akt w7aky w7alb w7ami w7aph w7aqz w7asy w7awq w7axc w7ayo w7ayr w7baa w7bd w7bgh w7bhe w7bka w7bnb w7bne w7bne w7bpj w7brg w7bsx w7bwk w7bws w7byc w7byw w7cau w7cum w7gj w7hs w7ip w7it w7jb w7bk w7oi w7ol w7pk w7rt w7tx w7ve w7zp ve4bi ve4ci ve4dj ve4gq ve4it ve5bh ve5fo ve5hr k5aa k6aja k6auq k6bxq k6cbj k6cib k6ebr k6fab k7atc x1aa x1ax x1d x1n x1u cm1pw cm2fn cm2jm cm2mg cm5ag cm5of cm5ry ny1aa ny2ab cf2m t12rc hc1fg hh7c oa4d vk2oc zl3aw zl3cc ear227

W6WO, Leonard Robinson, 1521 West 8th St., Los Angeles, Calif.

7- and 14-mc. bands

ac6aa ac6zz ac8cq ac8na au1ay au1cz au1kab ce3ag ce7aa cm2lcc m2ww cm5ea cm8az cm8yb cn8ma cn8mb cn8mi ct3ab cx1af d4adc ear185 ear228 f3cck f8pz g2nu g2by g2pd g5by g5yk g6hp hc1ap hc1fg hc2jm hh7c j1ct j1dh j1dm j1dn j1do j1ee j1ek j1el k1ep j1eq j1er j1es j1et j1ex j1ff j1fh j2cc j2ce j3cc j3ce j3cf j3cr j3db j3de j3df j3ol j3dp j3du j5cc j7cb k4fy k5aa k5ab k5ac k5ad k6ain k6aja k6alm k6arb k6auq k6baz k6boe k6bmy k6cib k6cbj k6cog k6crw k6dmm k6ebr k6etf k6fab k6fcx k7aag k7abs k7atf k7bde k7ox k7pq k7tf ka1cm ka1co ka1lq ka1lx ka1hr ka1jr ka3aa ny1aa ou4u ok2lo om1tb om2cj om2dn om2tg on4jj pa0ld pk3bm pk4da su8wy ve2ac ve3wa ve3wb ve4bi ve4bq ve4bv ve4ci ve4dk ve4dq ve4ej ve4fh ve4fp ve4ft ve4gd ve4gy ve4hm ve4ih ve4it ve4kj ve5bo ve5es ve5ff ve5hh ve5oc vk2ax vk2ba vk2br vk2gr vk2he vk2hl vk2hq vk2jz vx2pp vk2pz vk2nr vk2ns vk2wa vk2wd vk2wr vk2zr vk3bx vk3ek vk3el vk3es vk3lq vk3ml vk3nm vk3oo vk3pa vk3rj vk3rp vk3rs vk3rw vk3tm vk3wl vk3zz vk4lh vk4ah vk4xk vk5gh vk5hg vk5mh vk5ml vk5wa vk5wr vk5xk vk6gf vk6rl vk7bq vp1ja vq2bh vs2ab vs6ae vs6ag vs6ah vs6an vs7al x1aa x1u x9a x29a x29b xu1u z1lbn z12bl z12gn z12hi z12je z13cc z13ct zs2a zs2x zs5u xx1yz

W6DLF, Aubrey J. Hopkins, 4548 Hawley Blvd., San Diego, Calif.

7-mc. band

sm7rv py1ff lu5ar pk1jr ka1hr ka1jr zs5u zs5j zu6w hh7c j1ee j1ep j1ct j1dn j1dm j2ce vk2oc vk3vp vk3ws vk3zb vk5gk vk7ch z11aa z11gq zl3ci zl3cl x1aa x1x x1l x1n x1u x1x x29a x29b ve2ai ve3bm ve4bz ve4dt ve4hm ve5fc ve5ff ve5fg ve5fh k4rk k5aa k5ab k5ac k5ad k6acw k6auq k6bol k6cqg k6cib k7ebr k6fws k7hj k7po k7atf cm2jn cm8sb au1ca

• I. A. R. U. NEWS •

Devoted to the interests and activities of the

INTERNATIONAL AMATEUR RADIO UNION

President: H. P. MAXIM *Vice-President:* C. H. STEWART *Secretary:* K. B. WARNER

Headquarters Society:
THE AMERICAN RADIO RELAY LEAGUE, West Hartford, Conn.

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Wireless Institute of Australia
Wireless Society of Ireland

Conducted by Clinton B. DeSoto

AMONG the many possibilities of interest brought to us by the approach of the 1933 New Year, is that of witnessing the near approach of the awaited sun-spot minimum, when our predicted radio cycle will reach its first high spot since 1923, the year international amateur radio was inaugurated. We can expect increasingly better DX on the lower frequency bands — unfortunately along with correspondingly increased interference — and more spotty operation on the higher frequencies. The 14-mc. band will, it is anticipated, work miraculously some days, not at all on other days. We will not be able to definitely analyze or predict these minor changes for some time to come, but their observation can be a highly valuable and absorbing phase of amateur activity during the coming year. In general, the intensely interesting period of radio "weather" that we have been closely observing for the past year or two, will grow even more fascinating during 1933.

An innovation in field days is to be attempted by the R.S.G.B. during the week-end of June 10 and 11, 1933, when a National Field Day is to be held. All British districts will place portable stations in operation and points will be scored for contacts with other districts and with foreign stations. Extra points will be counted for QSO's with foreign portable stations. It is hoped that as many European societies as possible will assist in making this the largest field day ever organized. All correspondence in connection with this event should be directed to R.S.G.B. headquarters at 53 Victoria St., London, S. W. 1.

Unreliability seems to have been the keynote of 14-mc. operation during the past summer and autumn. At times, in the various localities, strong signals poured in from all parts of the world. These periods were usually of short duration, however, and were intermingled with spells of fading and days and nights when there were no signals at all. In Europe, during the summer, the good periods were very brief, often not lasting

EAR224, OWNED BY MANUEL R. CANO, USES TWO TYPE '10'S IN THE OUTPUT STAGE WITH 75 WATTS INPUT

for more than half an hour. The antipodes and Asia were the most inconsistent, although many W QSO's lasted only long enough for an exchange of reports. PA0QQ reports signal strengths of R8 as being quite frequent, but for rag-chewing and the Olympic Games traffic-handling going on at that time, the band was unreliable.

W8AYU has analyzed conditions during October as being half bad and half good, the first two weeks being excellent. The last half, on the other hand, he regarded as very poor. A pickup during the first part of November corresponds with observations here in New England, European signals appearing almost every morning in which listening was done.

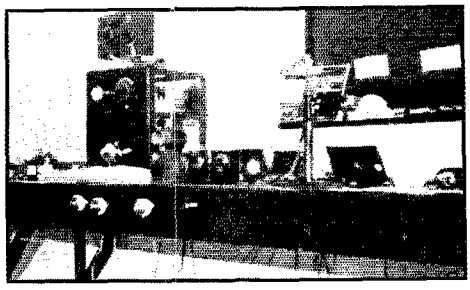
An announcement from the R.S.G.B. gives the rules for the 1933 B.E.R.U. Contest. Two events are to be staged, one for the Senior Trophy (power unrestricted) and the other for a new Junior Trophy (input 25 watts maximum). A B.E.R.U. receiving contest will also be held at the same time. The Senior contest will take place

EAR96, PREËMINENT SPANISH DX STATION OF J. M. DE CORDOVA, IS A 500-WATT STATION WHICH HAS WON NUMEROUS HONORS FOR ITS OWNER, INCLUDING TWO SILVER CUPS DURING 1932

during the first two week-ends in February, and the Junior contest during the last two week-ends. The receiving contest will continue throughout the four week-ends of the tests.

The 1933 contests will be open to all members of Honorary B.E.R.U. Affiliated Societies, as well as to individual B.E.R.U. members. This arrangement was made by the R.S.G.B. to meet the wishes of certain overseas societies.

In connection with the R.S.G.B.'s 3.5- and 28-mc. tests, which were announced in this department of the December issue, word has just



THE OPERATING TABLE AT VK5LC, I. E. CATFORD, CALTOWIE, S. A.

A 3-stage xtal, FD, PA transmitter at 30 watts has worked fifteen countries and five continents (three times in a week, on one occasion).

been received that these contests will extend from 1200 G.C.T. Saturday to 2400 G.C.T. Sundays, and not from 0001 G.C.T. Saturdays to 2400 G.C.T. Sundays.

Multiply the struggles of every beginner breaking into the amateur game by a hundredfold, and you have a fair estimate of the early radio experience of Mg. Hla Aung, Burma's pioneer radio amateur. "I started in the game in about '26," he writes. "Nobody on the air and nobody to work. Listening hams were a rarity. With difficulty I rigged up a 40-meter xmitter using home-made parts, as no suitable equipment could be bought at any price in Burma at that time. Then I found nobody in town or outside owned a short-wave set."

Of necessity, all experiments were abandoned until 1928. In that year, however, "I built up a 20-meter transmitter with receiving apparatus, using 180 volts from batteries on a receiving tube. For a fortnight I called CQ, with no result. Then, one day, the thrill of a lifetime came. I was listening to stations from abroad one evening and envying the great number of amateurs heard calling CQ. I heard one PK station, very loud, calling a long CQ. As he finished, I switched on the weird-looking equipment I called my transmitter, with dignified steadiness of hand, as if I had been in the game for a century and working the antipodes were mere child's play. A moment; then I switched off and listened. The great thrill of my life came — the answering signal 'r r ok ur sigs dc etc. etc.' So astonished was I that when I answered him my key turned into a bug, dots becoming dashes and dashes becoming dots. My hand stiffened, paralyzed; I couldn't move it. That night I could not sleep. I had only one watt of power."

Now, as VU2AC, Mg. Hla Aung is a full-fledged amateur, constantly active. He lives at 103 Pagoda Road, Rangoon, Burma, the only native among Burma's three amateurs.

The annual meeting of the R.S.G.B. is scheduled to be held on December 20th, when Dr. E. H. Reyner, a vice-president, will deliver a lecture.

A real fever of 56-mc. work seems to have enveloped most nations recently, with the unique possibilities of this band being fully appreciated for perhaps the first time. In Great Britain, on September 25th, the first organized 56-mc. field day was held by the four London districts. G6YK, G6CL, G6UT and G2NH were the active stations. Several contacts were established, a full account of the work appearing in recent issues of *The T & R Bulletin*. The enthusiasm has spread to most other parts of the British Empire, in South Africa, New Zealand, Australia. H. B. Arthur, ZL1AN, made a strong appeal for more New Zealand 56-mc. activity in a recent issue of *Break-In*, and the result was a large amount of apparatus-building. In Hong Kong, in Shanghai, and in the other internationally known radio communities, five meters is rapidly attaining the status of a major diversion.

In the Netherlands, the Rotterdam section of

the N.V.I.R. has a number of 'phone stations working duplex on sked. A test between ship and shore found contact being maintained until the ship was 5 km. out in the North Sea. The southern districts held a 56-mc. field day with successful QSO's over 10 to 12 km. A number of relay tests and experiments with reflectors are now being conducted.

Attention of amateurs in all parts of the world is invited to the announcement of the Fifth International DX Contest elsewhere in this issue. This year the rules will be somewhat simplified in that no entries whatsoever will be required, and every amateur can take part. Instead of exchanging messages as in previous years, participants will exchange self-assigned serial numbers for identification purposes.

The winning participant in each country will be awarded an especially engraved watch charm, bearing the victor's call signal and a suitable inscription.

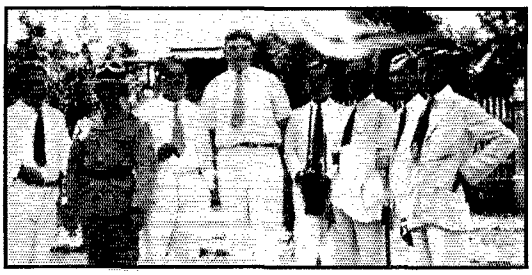
Our occasional references in text and picture labels to the types of Philips tubes in use at many foreign amateur stations has led to wonderment on the part of some amateurs, particularly in North and South America, as to exactly what sorts of tubes these type numbers indicate. The following information concerning a few of the more popular Philips transmitting tubes should help to clarify this confusion.

The TC 03/5 corresponds roughly to the American type '45, using plate voltages from 150 to 300, with a maximum plate dissipation of 6 watts. The amplification factor is 6; the plate resistance 2500. Up to 10 watts can be taken out of it as an amplifier, although the rating is 5 watts. The TC 04/10 can be said to correspond with the type '10, permissible plate voltages being 200–500, with a maximum plate dissipation of 10 watts. The amplification factor is 25; the plate resistance 12,500. The power rating is approximately twice that of the TC 03/5. These tubes have two horns on top for the grid and plate connections.

CT1GU, THE WAC STATION OF ANTONIO B. CARVAILHAIS, PORTUGAL

15 to 30 watts input to the TC 04/10 in the final stage of the CO-FD-PA outfit is the customary power.

The screen-grid QC 05/15 resembles the type '65. Plate voltages are 400–500; screen voltages 75–125. Maximum plate dissipation is 15 watts. Amplification factor, 225; plate resistance, 160,000. It is a queer looking tube by American standards, the grid terminal being on the top while the plate connection is made near the bottom of the glass envelope. The element construction resembles a group of telescoped square metal boxes. All of these tubes have 4-volt filaments, the last two drawing 1 ampere, the TC 03/5.29 amperes.



THE MEN BEHIND THE KEY AT KA1HR, WELL-KNOWN PHILIPPINE STATION

The operators doing most of the traffic-handling are Gallardo, third from left, and Espejo, sixth from left. Lieut. Richon, center, is the officer in charge of the station.

In the higher power class we find, corresponding to the '03A, the TC 1/75, which has a 10-volt filament drawing 1.6 amps. Plate voltages from 800 to 1500, maximum plate dissipation 75 watts, amplification factor 25, plate resistance 5000. The highest power triode is the TB 2/250. having the same power rating as the '04A. The 11-volt filament draws 3.18 amps.; plate voltage is 1000–2000; maximum plate dissipation 150 watts.

The 75 watt screen-grid tube, the QB 2/75, resembles the 860 not only in characteristics but in appearance. The maximum plate dissipation, at 2000 plate volts, 300–500 screen, is 75 watts. The filament consumption is 3.25 amps. at 10 volts. The amplification factor is 200, the plate resistance 150,000.

Brief items of gossip from the month's mail: Further with regard to the LOÃ, etc., calls discussed in our September '32 issue .. .. .. These stations are British Army stations, not Navy; the latter are nearly all c.c., omit the "rough stuff," and work on 8500 kc., or so says a VS6 correspondent .. .. .. LOÃ is actually in VS6, he adds, and "gives us a pain in our respective necks" .. .. .. Another new African prefix (new so far as we're concerned, at least) reported by W8AYU — UH1AA, in French East Africa .. .. .. The UH prefix is assigned to Hedjaz, and the low-pitched r.a.c. on 14.3 mc.

(Continued on page 90)

THE COMMUNICATIONS DEPARTMENT

F. E. Handy, Communications Manager
E. L. Battey, Assistant Communications Manager

DX—Then and Now

ANYONE who may have lived through the good old days of ham radio prior to the war will verify the excellent receiving conditions that obtained at that time. Delaware Valley Radio Association *News* (July) has a contribution by E. P. Knowles, ex-W3BAP, bearing on this. Ed. Raser, W3ZI-W8GHY, sends us this information with permission to reprint Mr. Knowles' report, which is quoted herewith and we feel sure will be of great general interest.

"While listening on 600 meters a few nights ago, using detector and two stages of amplification, I heard NAX, the Naval Station at Colon, Panama. The signal was QSA2 or 3. In 1913–14 using a home-made loose coupler, a hunk of galena or silicon for a detector and a cheap pair of 'phones I have been able to hear signals from the old 1 k.w. spark at NAX ten to fifteen feet from the 'phones. (The wheel came off the non-synchronous rotary once and went through the roof of the shack.)

"Now, in 1932, with a modern c.w. transmitter at NAX and a regenerative detector and two-stage amplifier at this end, signals are no better, if as good as they were in 1913. How come?

"In 1912 while working for the United Wireless Co. on ships equipped with a double-slide tuner and carborundum detector, I have copied press from WCC (Chatham, Mass.) on 1800 meters while in South American waters. Try to do it now. With a 1-k.w. spark and this receiver I have exchanged traffic with "NY" the old United Wireless Station at 42 Broadway, N. Y., while cruising in the West Indies, and have played checkers with "HA" (Cape Hatteras) while 500 to 600 miles off shore, in daylight. In 1915 while docked at Jamaica, I have copied press three solid hours from WHB (New York *Herald*) in spite of tropical QRN — using crystal detector with no amplification.

"All the above seems to indicate the changes in propagation conditions that are taking place, at least on the longer wavelengths. I am not trying to intimate that crystal detectors can compete with vacuum tube detectors as distance getters, but that conditions were better in the days we used crystal detectors."

O.R.S. QSO Party

FIVE O.R.S. Parties have been held to date, *each* more successful than the last. The number of reporting participants has been progressively higher each time, and the scores rolled up have similarly grown larger.

In the October 22–23 QSO Party, W9AUH reported the highest score. He worked 90 Official Relay Stations (of 184 heard by him taking part) in 35 different A.R.R.L. Sections. The winners from the inception of our O.R.S. Parties have been: W8DFE 47 worked in 19 Sections; W9IU 57 worked in 30 Sections; W5BMI 78 worked in 32 Sections; W9AUH 56 worked in 29 Sections; W9AUH 90 worked in 35 Sections!

The eleven highest scoring stations having over 5,000 points are indicated below. Detailed information on the scores of the 229 reporting participants in our October '32 O.R.S. Party will appear in the January 1933 Official Relay Station Bulletin to be issued shortly. This is mailed exclusively to A.R.R.L. Official Relay Stations, affiliated radio clubs and field organization officials.

HIGHEST SCORES — OCTOBER 1932

Call	*Score*	*O.R.S. Worked*	*Traffic With*	*Other O.R.S. Heard*	*Sections Worked*
W9AUH	12,670	90	88	94	35
W5BMI	9,792	71	69	6	34
W4ZH	9,579	103	99	4	31
VE3CP	9,120	84	80	..	30
W9FUT	8,091	70	68	53	31
W3LA	6,664	53	47	32	28
W9BWJ-ZZBZ	5,771	43	31	82	29
W8BYD	5,616	45	40	59	24
VE3AD	5,104	46	38	102	22
W2TP	5,096	57	53	29	26
W6CXW	5,040	51	46	20	30

ANNOUNCEMENT — TO O.R.S.

Remember the dates of the coming O.R.S. Parties — mark the calendar now:

January 21st–22nd
April 22nd–23rd
July 22nd–23rd
October 21st–22nd

Plan to take part. Scoring rules:

For each O.R.S. worked..... 4 points
For O.R.S. heard, but not worked..... 1 point

Multiply the *sum* of all points made as above by the *number* of A.R.R.L. Sections worked. See list of Sections p. 5 *QST*.

The official O.R.S. list will be mailed to all appointees just before the dates of each contest period. Non-ORS may make application for appointment by writing the proper Section Communications Manager. (See page 5, this issue *QST* for his address.) The qualifications for O.R.S. appointment are indicated in the Rules and Regulations of the A.R.R.L. Coms. Dep't which will be sent on receipt of a postal requesting same.

PRIZES: Mr. G. H. Graue, W9BKJ, Fort Wayne, Ind., and Mr. G. P. Taylor, W9BAN, Henderson, Ky., have each offered a power-type first-quality *quartz crystal* as prize. Thus, a crystal will be presented to each of the *two* highest-scoring Official Relay Stations reporting in the January 1933 O.R.S. Party!

Relay Reliably—Originate Only Good Traffic

IN RECENT operating work I have paid much attention to the way some of the fellows route messages. I have sent messages and tracers to see where they went, and how fast they travelled. Some interesting things were learned. One message for Canada was found 200 miles further from its destination than the starting point, and had been through four Texas cities. Also I had the experience of listening to two stations sitting and trading traffic (without regard to its destination) just to run up their totals. These are typical examples of inexcusable inefficiency in the relaying of message traffic. The few fellows guilty of such practices and irresponsibility ought to consider what they really accomplish by such haphazard work. Real relaying requires some brain work. Any operator who has a degree of real amateur

spirit will accept *responsibility* for such traffic as falls his lot to relay. Such an operator will use intelligence in routing messages. They will be placed *nearer* their destination, or put in the hands of operators who have schedules which will place the dispatches close to their destination. Our *"real" operator, moreover, will try to move his traffic* speedily onward, and will never be caught and shamed by being overheard engaging in senseless or corrupt traffic practices.

The good operator also will not originate worthless messages either. Such traffic causes deliveries to fall short in the national accounting of messages — while the important ones get through, and get through quickly. Poor, meaningless traffic should be cancelled *at its source*, but *every* message (regardless of text) that gets started on its journey should be relayed and delivered promptly. We want to boost those deliveries to 100%, what say, fellows?

— W8AVF, O.R.S., Jacksonville, Texas

The Western Radio Communication Society (West Philadelphia, Pa.) held an outing on Sunday, July 31st. One of the main events was a "Hidden Station Contest" or "Treasure Hunt" for portable station W3CHS. An amusing incident occurred when one of the searching parties (W3BWP's party) came upon a Zepp. and thought the hidden station had been located. Investigation proved that W3 . . . was the station "discovered." The operator of W3 . . . , who incidentally did not own any monitor or frequency meter, was desperate when he saw this crew with the direction-finding equipment bearing down on his station. He thought the R.I. was paying him an unexpected visit! He solemnly promised to start the necessary construction next day. (The transmitter was so well hidden none of the contestants found it although within 500 or 1,000 feet of the spot several times. At noon the directions to proceed to the basket lunches was transmitted — baseball, swimming and canoeing followed.)

P. I. CONVENTION

On July 3rd a Philippine Section Convention was held at Calauan, Laguna, and went over with a bang. Hams from the most northerly district as well as the Southern Islands were in evidence. Practically every active amateur in the Islands was on hand. KA1JR and KA1SL were reëlected as regular officers. Greetings were sent mainland A.R.R.L. officials (W6HM and W1AW). It was resolved that the S.C.M. communicate with the U. S. and Insular Government officials, offering the services of amateur stations for any emergencies. The Bureau of Posts was thanked for coöperation with P. I. amateurs. The Governor-General was instructed by resolution to "maintain the *status quo* or enlarge the present overcongested amateur bands" if possible. It was reported that Japanese stations were unable to QSP, but that the Japanese Consul promised this ruling might be modified soon. KA1AC KA1DP KA1UP KA1SP KA1SL KA1RT KA1XA KA1WR KA1LG KA1JR KA1LY KA1DL KA1NL KA1EL KA1SS KA1ST KA3AA KA8AA KA1ZC KA1PB and KA1HR were all well represented at this successful get-together.

O.B.S.

THE following is a supplement to the list of A.R.R.L. Official Broadcasting Stations in November *QST* (page 51):

W3APV, W3KW
W4MR
W5NT, W5ON
W6FPU
W8DME, W8FZE
W9EL, W9HWE

Traffic Briefs

W5ANR wants to know how much filter you have when you have six mikes of factory-made and four mikes of home-made, and then a Rhode Island Red hen lays an egg in your power pack? Yes, it actually happened!

BRASS POUNDERS' LEAGUE

Call	*Orig.*	*Del.*	*Rel.*	*Total*
W2DIU	742	220	940	1902
W3CXL	221	237	1128	1586
W6PQ	631	129	640	1400
W5BMI	138	151	1084	1373
W8PP	135	147	1058	1340
W9HCC	85	92	1146	1323
W5OW	291	182	828	1301
W6DPJ	162	29	1053	1244
W9EPJ	225	147	864	1236
W8BJO	263	134	835	1232
KA1HR	189	776	208	1173
W4WZ	127	109	816	1052
W9EUT	205	145	651	1001
W8YA	171	140	648	959
W8DDS	207	256	488	951
W3BKQ	285	162	484	931
W3NB	311	113	496	920
W1CJD	41	71	736	848
KA1LY	252	366	224	842
W9EYG	67	62	692	821
VE3CP	167	158	484	809
W9BKK	132	246	416	794
VE3AD	169	136	489	794
W8DLG	36	54	702	792
W9VS	130	193	467	790
W1VS	91	171	513	775
W9BN	29	83	588	700
NY1AB	92	143	464	699
W6CDU	132	359	198	689
W9FRA	141	39	508	688
W3BWT	117	164	406	687
VE5HP	89	133	461	683
W9BNT	231	182	260	673
W9YB	224	164	273	661
W5FC	621	10	10	641
W9KG	33	50	547	630
W2WP	47	121	458	626
W9BFH	179	204	242	625
W9CTP	150	126	339	615
W9ENH	45	103	459	607
W1MK	123	148	312	583
W7AWH	9	21	552	582
W8FDY	149	101	311	561
W7NR	127	233	185	545
VE3GT	199	199	147	545
W8FX	56	120	362	538
W8CST	63	30	442	535
W3FJ	91	137	304	532
W2BZZ	57	60	414	531
W2BFY	91	67	371	529
W4ZH	278	78	166	522
W8YP	91	109	317	517
W9EIV	39	33	444	516
W8FTV	41	16	452	509
W4NC	165	39	304	508
W6NAC	216	108	168	492
W4JR	143	165	166	474
W9DGS	98	107	244	449
W8BBH	68	102	273	443
W8FLA	129	105	207	441
W2ADQ	198	235	5	438
W8BYD	161	163	92	416
W9AUH	201	191	20	412
W3MC	59	107	242	408
W9BNN	162	102	142	406
W1YU	135	105	160	400
W6CFN	178	123	90	391
W8FDV	165	181	39	385
W1ASY	112	106	144	362
W1BVP	132	156	58	346
W2DBQ	74	106	154	334
W9BMA	92	102	134	328
W1BDI	83	110	125	318
W9FJV	52	103	148	303
W8BGY	117	113	64	294
W7AAT	119	118	52	289
W7OV	82	151	32	265
W4TO	121	119	22	262
W6ETL	66	103	88	257
W2ADQ*	108	122	26	256
W2TP	113	100	43	256
W5BOE	94	114	24	232
W8BJU	124	105	—	229
W9AET	104	103	22	229
W8CVS	86	100	40	226
W6HM	71	120	—	191
W1UN	75	110	—	185
W1CD	11	128	23	162
W9FCS	32	108	18	158
W9NP	15	104	22	141
W9RT	—	125	—	125

Month of October 16th–November 15th. Note the stations responsible for above *one hundred deliveries*. Deliveries count!

A total of 500 or more *bona fide* messages handled and counted in accordance with A.R.R.L. practice, or just 100 or more *deliveries* will put you in line for a place in the B.P.L. Why not make more schedules with the reliable stations you hear and take steps to handle the traffic that will qualify *you* for B.P.L. membership also?

* Listing for this station for September–October.

Traffic Briefs

Sparks, published by J. B. Sanders, W5CDG (Editor, Glen Talbutt, W5AUL; Assoc. Ed. and Adv. Mgr., Roy Taylor, W5RJ) is by and for Fifth District hams. It is printed newspaper style, 10 whole pages of ham dope in the August number — a fine example of amateur journalistic enterprise, and only 50 cents a year. Activities are looking up, down in the Fifth, and *sparks* will work to add "pep" and ham enjoyment in the West Gulf and Delta divisions. Dedicated to Fifth District hams *Sparks* is in a position to give special attention to the problems and interests peculiar to that locality.

The Bluefield Amateur Radio Club (West Va.) was sponsor of a hamfest with some 50 of the fraternity in attendance on Sunday, August 7th. The meeting opened with a luncheon at the West Virginian hotel. Guests were welcomed by Lawrence M. Dunnam, W8EIK (ex-3ZY, 1921), the club President. Speakers were Capt. J. A. Hammond, Signal Corps Reserve, U.S.A.; Lt. Howard C. Welling, Q.M.C. Reserve, and J. Frank Key, W3ZA, who discussed antenna systems. Luncheon period doings were broadcast over WHIS and trips to the local airport and ham stations were arranged. A number of the gang remained over until Monday, at which time examinations were conducted by F. M. Kratokvil, Federal Radio Commission Inspector of the Detroit office. The Bluefield Amateur Radio Club is holding weekly meetings. There are 18 members at present. Plans are under way to obtain permanent club rooms and install a 100-watt transmitter.

"There has been much said in *QST* about r.a.c. vs. p.d.c. signals. No one has yet found a way to stop the use of r.a.c. Here is my suggested remedy. I have made a practice of passing up nearly all stations with broad signals whether they are answering my CQ or calling CQ themselves. And when I happen to work one I do not hesitate to tell the op just what it sounds like. I am sure if all operators with good d.c. notes would do the same, operators with bad signals wouldn't get 81% of their calls answered as some hams seem to think they do. Wouldn't this be a sure way to clear up the situation? If other hams wouldn't work them, the operators with poor signals would be forced to clean up their notes." . . . W1DLD

Directional CQs bring results: Having ordered radio parts from a New York firm and wishing to find out if the order had been sent W5APM called "CQ N.Y.C." Turning on the receiver, and without even touching the dial, he heard a "W2" answering the call. This "W2" was just a few blocks from the firm from which W5APM had ordered the parts! . . . Another example of productive directional CQs is told by W6CVR. He gave W6CAP a message for the Naval Academy at Annapolis, Md. W6CAP called "CQ East," and was answered by NEDF. W6CAP inquired, "QSP Annapolis Naval Acad?" and NEDF replied, "Hr Annapolis, MK." Thus the message was put right to its destination. . . . Still another example of QSOing the spot wanted is related by W8EFW. With a message for W8EJY he tuned around looking for a good traffic station to QSP. Hearing no likely station he sent out a "CQ" — imagine his surprise when he was answered by W8EJY! Not only did W8EFW clear his message but W8EJY had traffic for two members of W8EFW's local club. . . . W4CP, Rocky Mount, N. C., tells of his successful use of the "directional CQ." A rush message for N.Y.C. was filed at his station. He called "CQ NYC." W2CWW on Staten Island came back, took the message (which was an order for merchandise) and made delivery by telephone. The merchandise was shipped from New York and arrived in Rocky Mount the same night. That's service, plus, thanks to the directional CQ. . . . W9EQG writes of an interesting incident on the 14-mc. band. He had raised W6CKO on a CQ and was getting a report on his signals, when he heard W4ACM calling him (W9EQG) right on W6CKO's frequency. W4ACM had traffic for W6CKO. W9EQG asked W6CKO to QRX, took the traffic from W4ACM and QSPed to W6CKO.

Relative Traffic Standings

(OCTOBER–NOVEMBER)

Messages Per Station (25%)		*Stations Reporting Traffic* (25%)		*Gain or Loss (Traffic Reports)* (25%)		*Traffic Total* (25%)		**Standing Based on Average of All Four Ratings %**		**Leading Section in Division**
Atl.	105.1	Cen.	379	Cen.	+40	Cen.	27278	**Central**	**89.3**	**Michigan**
Dak.	101.5	Pac.	319	Atl.	+39	Pac.	20314	**Atlantic**	**89.3**	**Eastern Pennsylvania**
W. G.	96.4	Mid.	176	Pac.	+36	Atl.	17881	**Pacific**	**76.9**	**San Francisco**
R. Mt.	92.7	Atl.	170	Mid.	+32	Mid.	12242	**Midwest**	**71.5**	**Missouri**
Hud.	88.1	N. E.	169	Hud.	+31	N. E.	11789	**Hudson**	**64.3**	**New York City-L. I.**
Delt.	79.5	N. W.	127	N. W.	+25	Hud.	9783	**Dakota**	**59.**	**Southern Minnesota**
Cen.	71.9	Roa.	116	Delt.	+25	Dak.	9548	**New England**	**57.2**	**Connecticut**
N. E.	69.7	Hud.	111	Roa.	+20	Roa.	8007	**Roanoke**	**42.9**	**Virginia**
Mid.	69.6	Dak.	94	Dak.	+17	W. G.	6266	**Northwestern**	**42.9**	**Oregon**
Pac.	63.6	Can.	83	N. E.	+ 7	N. W.	6182	**West Gulf**	**41.1**	**Northern Texas**
S. E.	62.4	S. E.	70	Can.	+ 5	Can.	5109	**Delta**	**39.3**	**Arkansas**
Can.	61.5	W. G.	65	S. E.	+ 2	Delt.	4695	**Canada**	**28.5**	**Ontario**
Roa.	60.4	Delt.	59	W. G.	— 1	S. E.	4370	**Rocky Mt.**	**25.**	**Colorado**
N. W.	48.6	R. Mt.	31	R. Mt.	— 6	R. Mt.	2876	**Southeastern**	**23.2**	**Ga.-S. C.-Cuba-etc.**

THE TEN HIGHEST SECTIONS

S. C. M.

P. I.	222.7	Los Ang.	169	Va.	+19	Mich.	8015	**Michigan**	**47.5**	**Conroy, W8DYH**
S. Minn.	153.8	Mich.	130	E. Pa.	+19	Ill.	6855	**Ohio**	**45.**	**Tummonds, W8BAH**
N. N. J.	151.9	Mo.	81	N.Y.C.-L.I.	+17	Los Ang.	6584	**Missouri**	**45.**	**Cannady, W9EYG**
M.-D.-D.C.	149.8	Ill.	78	Ohio	+13	S. Minn.	6462	**Los Angeles**	**45.**	**Nahmens, W6HT**
Ont.	140.4	Ohio	71	Wisc.	+13	E. Pa.	5878	**Eastern Pa.**	**42.5**	**Wagenseller, W3GS**
Ark.	139.2	Va.	67	Mo.	+11	Ohio	5680	**Illinois**	**40.**	**Hinds, W9APY**
Ga.-S. C.	135.2	Wash.	62	Ore.	+11	W. Pa.	4236	**So. Minnesota**	**40.**	**Radloff, W9AIR**
N. C.	129.3	N.Y.C.-L.I.	60	E. N. Y.	+11	Conn.	4232	**Virginia**	**37.5**	**Eubank, W3AAJ**
W. Pa.	128.3	E. Pa.	48	Sask.	+11	N.Y.C.-L.I.	4064	**N. Y. C.-L. I.**	**32.5**	**Grainger, W2AUS**
S. F.	128.2	Conn.	47	Tenn.	+11	Mo.	3758	**Philippine I.**	**25.**	**Thompson, KA1XA**

The "Michigang" again "turns the trick" and MICHIGAN holds the Banner for the second consecutive month. Next in line come Ohio, Missouri and Los Angeles. L. A., for the *fifth* consecutive month, sets *a new "all time high"* in number of stations reporting traffic with *169 traffic reports!* Michigan is also well over the 100 mark with "130 stations reporting traffic"! The National figure for Traffic Reports is *a new high of 1969*, a gain of 272 over the previous month. And the National Traffic Total is 146,340, also breaking all previous records. If you aren't one of the *1969* amateurs who reported traffic this month, we invite you to make up for it by reporting to your SCM (see page 5, this *QST*) each month on the 16th the amount of traffic you handled in the preceding thirty days. There have never been such active days in traffic handling as we are now enjoying — get in on the fun!

During the traffic reporting month October 16th–November 15th, 1969 stations originated 36,663; delivered 31,766; relayed 77,911 total 146,340. (86.7% del.) (74.3 m.p.s.)

Code Practice

We announce the addition of the following transmissions to the list of "1715-kc. Stations Sending Code Practice" on page 36, December *QST*: — W6CBF, Oakland, Calif., 1939-kc., Tuesdays and Fridays, 8:00 p.m. P.S.T.; W9BSP, Olathe, Kansas, 1903-kc., daily, 7:30–8:30 p.m. C.S.T.; W9JCH, Appleton, Wisc., 1900-kc., daily, 7:00–8:00 p.m. C.S.T.; W9JUO, Aurora, Illinois, 1945-kc., daily, 8:00–8:45 p.m. C.S.T. W9FXE offers a suggestion to "code learners" in the middle west: Station KSAC, Manhattan, Kansas, broadcasts code lessons on 580-kc. for one hour each Saturday, 12:30–1:30 p.m. C.S.T.

W1MK Schedule

Effective January 1, 1933 the following schedule will be used at W1MK for the transmission of "Official and Special Broadcasts" to A.R.R.L. members:

Sunday	8:30 p.m.	E.S.T.	3825 & 7150-kc.
	Midnight	"	3825 & 7150-kc.
Monday	8:30 p.m.	"	3575 & 7003-kc.
	10:30 p.m.	"	3575 & 7003-kc.
Tuesday	8:30 p.m.	"	3575 & 7150-kc.
	Midnight	"	3575 & 7150-kc.
Thursday	8:30 p.m.	"	3825 & 7003-kc.
	Midnight	"	3825 & 7003-kc.
Friday	8:30 p.m.	"	3825 & 7150-kc.
	10:30 p.m.	"	3825 & 7150-kc.

The transmissions at the times listed are at approximately 13 words per minute, and make good code practice for more advanced beginners. Try it sometime.

ATLANTIC DIVISION

SOUTHERN NEW JERSEY — SCM, Gedney M. Rigor, W3QL — W3ZX was afflicted with acute appendicitis. W3ARV has moved to Moorestown. W3APN was QRL election. New c.c. rig for W3ZI. W3ACJ will be on with new MOPA. W3BSX is out for ORS. W3BBD hooked a VK. W3BEI reports two off frequency. W3BYM was in Sweepstakes. W3AEJ has nine schedules. Watch for W3ATJ's OBS QSTs. Ted Ostman, winner of Hoover Cup for best station some years ago, can be heard on W3IS a one KW 'phone rig. W3BUU is an old telegrapher. W3BAA will be on c.c. W3CLQ has nice total. W3BPT can be heard consistently. W3AKI sends first report. W3BO is Army Reserve opr. W3BCW will handle traffic. W3APN and W3ZX are new RMs. W3APV, W3ATJ and W3ZX are new OBS. W3COD makes nice report. W3ASG has worked all districts except sixth on 1882-kc. 'phone. W3PC has a tourmaline crystal on 7 mc. W3ACJ reports a new ham in Ocean City, W3CLE. W3BGP is a commercial operator at WCAM. W3AYA moved into new quarters. The South Jersey Radio Association took in 12 new members. All hams are more than welcome to visit each third Thursday at American Legion Hall, foot of Graisbury Avenue, Audubon, N. J. If you get stuck on relays mail immediately to W3QL, W3ARV or W3APN. W3VX and W3BAY reported. Everyone please report on the 16th. Get the habit.

Traffic: **W3QL** 180 ARV 106 PC 95 BPT 87 ASG 90 COD 56 ATJ 47 AEJ 46 BYM 38 BEI 34 AKI 34 CLQ 29 BBD 26 BSX 19 ZI 16 ZX 11 BUU 10 BUB 5 BAA 4 BCW 9 BO 4 BGP 3 APV 3 AYA 1.

WESTERN PENNSYLVANIA — SCM, C. H. Grossarth, W8CUG — W8YA leads the Section with a nice total. RM W8DLG is second with a lot of schedules. RM W8AJE will be chief op. at the Sea Scouts' station. W8EIS lost a lot of sleep during the Sweepstakes. W8DKL threatens to rebuild. W8HGG is looking for morning schedules. W8ELZ and W8GBC are arranging schedules. Two new stations are W8GMZ and W8HWI. W8VI-W8GN was very QRL the Sweepstakes. "Sked trouble," says W8FKU. W8DYF reports for W8HAJ and W8FUW. W8ECH made 1407 points in the S.S. in three days. He reports for W8BFZ, W8CAF, W8FFD and W8DDU. W8EDG has a new a.c. receiver. W8KD says he won't be on for 5 or 6 years. W8DVZ works on 7 mc. W8CLG says his report was late, but it wasn't. W8BKS pounded brass during the S.S. W8HPQ kept his schedules at W8AVY while rebuilding. W8CQA was off the air due to transmitter trouble. W8CMP, our Director, helped Charles Stewart, A.R.R.L. Vice-Pres., build a new transmitter. W8BWX was off due to delay with his license. W8CEO is on 1.75 mc. for AA work. W8DGW may have some news later. W8EIV has dual transmitters and ops. W8DLV reports for the Greensburg gang, W8DVM, W8GJR, W8HXP and W8HWK. W8DNV has a new c.c. rig. W8BWL reports 30 hams in the vicinity of Altoona. W8DRO is working lots of DX on 7 mc. W8CMK has just about finished his new 1.75-mc. 'phone. W8FCV's new receiver isn't working so well. W8GKI and W8HIO send first reports. W8GYH is rebuilding for crystal. W8EEC has abandoned the idea of using a converter for c.w. W8CFR is plugging away at school. W8APQ reports after a long absence. W8CUG was active during the S.S. Say, fellows, look at the expiration dates on your ORS certificates and send them in for SCM's signature on that date.

Traffic: **W8YA** 959 DLG 792 EIS 251 AJE 233 CUG 214 DKL 183 HGG 178 APQ 150 ELZ 131 VI-GN 128 FKU 122 FUW 115 ECH 101 GBC 88 DYF 87 EDG 79 HAJ 77 KD 71 DVZ 63 CLG 49 BKS 32 CMP 25 BWX 23 DGW 16 EIV 14 DNV 13 DLV 13 DRO 7 BWL 7 CMK 6 FCV 4 GKI 5 GYH 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Harry Ginsberg, W3NY — W3BAK, E. L. Hudson, RM. W3BWT, E. W. Darne, Chief RM. The Washington Radio Club had 70 present at their Hamfest, Nov. 12th. The Delmarva Amateur Radio Club was organized Oct. 18th; W3CQS, Pres.; W3VJ, Vice-Pres.; W3BCS, Secy.; Marion Blades, Treas. Ted Smith delivered a talk on "Velocity Microphones" at the Nov. 18th meeting of the Institute of Radio Conferees. Especial credit is due W3ZD for his schedule with EAR96. W3HI is on 56-mc. 'phone every Tuesday night after 9 p.m. District of Columbia: W3CXL still "bats out" that FB total. W3BWT organized Trunk "C" from Washington to Florida. W3NR is using c.c. 50 watts. W3BOS is working plenty DX. W3IL was QRL the Hamfest. W3AJL is a new traffic station. W3CDQ is helping local traffic men. W3ASE calls himself "The Voice in the Wilderness." Maryland: W3SN is building new masts. Schedules are clicking FB for W3CJS. W3CDG blames QRM for not getting out. W3BGI needs 50-watter power supply. W3LA ran up over 6600 points in ORS Party. W3CQS wants ORS. W3AHG is "messing" with 56 mc. W3BRS has a 7155-kc. Hertz. W3ADO has resumed schedules. W3CV worked two YLs in one week. W3CIZ goes in strong for rag-chewing. W3HT has gone in for flying. W3BT is rebuilding. W3WN says the F.A.R.A. station W3CMG gets out FB. W3NY and W3DG are both QRL work. W3AVD is having station license trouble. Delaware: W3BAK is experimenting with MOPA. W3CPG has a new a.c. receiver.

Traffic: **W3CXL** 1586 BWT 687 SN 277 CJS 108 CDG 86 ZD 80 BGI 61 LA 54 NR 39 BOS 34 CQS 31 AHG 23 BRS 17 ADO 16 CV 12 BAK 12 IL 6 AJL 5 CIZ 5 CPG 4 CDQ 4.

EASTERN PENNSYLVANIA — SCM, Jack Wagenseller, W3GS-W3BF — Congratulations on the fine work this month, fellows. W3BKQ, W8FLA, W3MC and W8CVS make the BPL! W3OK changed QRG to 3781 kc. W3AHD has nine schedules daily. W3AKB works DX from every station but her own. W3YC at Dickenson College makes a fine showing. W3CL intends to go over the top. W8FJF reports via radiogram. Officers of the new York Radio Club are: W3AQN, Pres.; W3BCD, Vice-Pres.; W3CIK, Secy. W3PBX is an ORS. W8AFV leads the Scranton gang. W3BEY had a real hamfest on Thanksgiving. W3ADE is back again. W8CFI wants a schedule west. W8EUX is working hard. W3KW is an ORS transferred from So. New Jersey. W3EO is back on the air. W8EOH is training a new ham. First reports are received from W3DD, W3CRS, W3ABZ and W3BRV. W8HXH is portable of W8FLA which was used at Boy Scout Exposition. W3AZF reports again. W3ATR is on 7 mc. W3ALX has c.c. W3QV sends in his annual report: W3CHU reports in person. W8VD and

W8AIT are trying to see who can report the longest without forgetting. Watch W8CFF's totals now that he QRT with that blue-eyed blonde! W3CAA and W3DZ reported by telephone. W3CFA has new c.c. rig. W3BOL has portable at the PNG Armory. W3BUI has been busy grinding crystals. W3BRH remembered to report. W3BVX has a new shack. W3QP has a new SS receiver. W8EU moved to Wilkes Barre. W3BRU completely rebuilt. W3AFG has new multistage MOPA. W3CHH reports three blown filter condensers. W3GX reported via W3CL. W3BTP, W3CRS, W3CJA and W3AVI all report good health. W3BF is on regularly. A Happy New Year to all.

Traffic: W3BKQ 931 OK 458 AHD 430 MC 408 AKB 323 YC 247 CL 234 AQN 179 BPX 177 BEY 114 ADE 105 KW 87 CIK 80 EO 77 DD 68 AZF 55 BF 52 ATR 51 ALX 48 QV 38 CHU 38 CAA 34 CFA 31 ABZ 28 BCD 26 BRV 22 BOL 30 BUI 19 BRH 14 BVX 12 QP 11 BRU 7 AFG 6 CHH 6 GX 4 DZ 4. W8FLA 441 CVS 226 FJF 215 AFV 118 CFI 97 EUX 89 EOH 73 HXH 63 VD 40 CFF 36 AIT 18 EU 8.

WESTERN NEW YORK — SCM, Don Farrell, W8DSP-GYV W8FDY turns in a fine BPL total. W8FMX is a new O.O. W8DBX was QRL Sweepstakes. W8DII is now located in Norwich. W8AGS has a new Zepp. W8EUY has been rebuilding. W8CJJ is using '46s for doubler and buffer. W8BDK reports 56-mc. tests being conducted by the Gloversville Club. W8CMH is a Director of Radio for a troop of Boy Scouts. W8DHQ is now using c.c., thanks to W8AJ. W8BFG's unorthodox receiver works swell. W8DME handled some important traffic. W8AWX is QRL school. W8GWT reports new hams in Penn Yan: W8EHM, W8AVF W8AZN, W8BHB and W8DX. W8BFF is working all bands. W8GWZ is leaving for Ft. Lauderdale, Fla., and will be on with W4PAU. W8AYU handled traffic with K5AE. W8DSP is back on the air. W8HKF has been off on account of sickness. W8AED is busy from 7:30 a.m.-9 p.m., daily, in a grocery store. W8AFM has all his transmitters going. W8BGN is building a long-wave receiver. W8AOW sent out 27 O notices during the month. W8GPV reports for first time. W8BGL visited the SCM. W8CLP was in the Sweepstakes. W8IY has portable W8ZZCS. W8BEX is using new c.c. job. W8CDB has done some fine 56-mc. work. W8DLA is now on 3.5 mc. W8JV has 'phone on 1950 kc. W8GWS wants ORS. W8FYF is on 1.75 mc. W8AYI is a new station in Syracuse. The boys at W8EWE blew their type '10s. W8DMJ reports his traffic. W8AKX can't get a d.c. note. W8FFU is QRL school. Ernest Kimball is attending the Radio School at Port Arthur College, Texas. He won the Scholarship at the Western New York Section Convention. W8HNZ has changed QRA. W8BAI is a big Public Address man. W8GQ has a new W.E. rack. W8DPS has a pair of 50-watters. W8DT loaned his jugs for a local tube display. W8ADG loaned his '04A to the broadcast station in Utica. The Mohawk Valley Brass Pounders held a very successful hamfest on Oct. 22nd. The President and Secretary of the Utica Club attended the I.R.E. Convention in Rochester. W8HNV is now classed as a converter specialist. There is one new member in the M.V.B.P., W8ASP. W8BJO is high traffic man for the Section! FB! W8DHU has portable W1ZZBR. W8EIJ is on at Ticonderoga. W8QL is on 'phone 1876.2 kc. W8BLP is working DX. W8BLH can't get out at night. W8EKM is operating at W8BVI. W8FTB is building new c.c. job. W8GWM worked his first W6. W8GPN is building MOPA at Cornell University with the help of W8ADM. W8AKC wants to be ORS. W8GZM has made some schedules. W8AOR has been doing a lot of experimenting with Zepps. W8AIO has moved to Prattsburg. W8DWJ-W4ANS has closed his station at Brantingham. W8ERU sends in a nice bunch of dope on the Rochester gang. W8ERP is using 400 watts input on 7 mc. W8CN changed from 7 mc. to 3.5 mc. W8EFO and W8DFN are QRL business. W8HJT is Rochester "YL" op. W8HWQ is on 3.5 mc. W8CZB gets on occasionally. Starting with the Jan. 15th report the SCM is offering a prize each month to the station in the Western New York Section who handles the most traffic. "What can the prizes be?" Win one and find out. W8DEQ has cancelled all schedules. W8BR rebuilt the 2nd stage of his MOPA. The F.L.T.S. held their annual Hamfest at Kan-Yato Inn, Skaneateles, on Saturday, Nov. 19th. The Hamfest was well attended. M.L.C. Simpson from the General Electric Co. at Schenectady was the principal speaker. The SCM gave a talk on the League's activities. Starting Jan. 1, 1933, there will be a general cleaning out of all dead-wood in the Section. If you are interested in keeping your official appointment, report regularly on the 16th of each month.

Traffic: W8FDY 561 DBX 458 DII 231 AGS 120 EUY 64 CJJ 43 BDK 40 CMH 27 DHQ 24 BFG 18 DME 18 AWX 16 GWT 14 BFF 14 GWZ 13 AYU 9 DSP 8 HKF 5 AED 3 AOW 87 DEQ 24 BR 9 BJO 1232 DHU 143 QL 59 BLP 10 BLH 1 GWS 59 JV 36 DLA 27 DMJ 23 IY 22 CLP 16 GPV 16 BCL 13 EWE 15 FYF 4 AKX 2 FFU 2 GZM 97 AKC 45 GPN 16 ERU 15 GWM 8.

CENTRAL DIVISION

KENTUCKY — SCM, Carl L. Pflumm, W9OX — HOT-ZIGGITY! Traffic increases over 300% this month. W9AUH leads state; makes BPL. W9ZZBZ-W9BWJ is moving to Owensboro Dec. 1st. W9CIM is off to a good start. W9FQQ and W9KKG qualify for ORS. A.A.R.S. schedules keep W9HAX QRL. Cash is needed by W9BAN to QRO. 14-mc. 'phone interests W9CNE. W9BJA has trouble lifting his sigs over the knobs surrounding him. W9BAZ admits he has mastered bug. W9JYO is developing into reliable traffic station. W9ERH is settling down to business. 7-mc. rig just finished and on air at W9EQO. W9ELL is KY's most ambidextrous ham; he swats flies with one fist and CQs with the other! Hurrah for Glasgow, W9FBJ and W9FFI report with traffic. W9JPM is working much DX on 14 mc. We wonder what W9FZL has in his shack besides radio equipment. W8EI of "one-lunger" fame is on at Bowling Green. W9CKH has new outfit. W9EYW is getting good reports on new Class B. W9IFM has first-class operator's license. W9DPW is all puffed up about his new ticket. W9KLO at Chavies and W9KCZ at Winchester are new stations. W9JJO forsook radio for trigonometry. W9IPG is carrying on in his place. This month's rag-chewing honors go to W9GJZ. W9CDA is forever rebuilding. Landlord remodeling basements keeps W9FZV from pounding brass. "No time for radio, going back to school this year," says W9CRJ. SCM extracts report from W9ETD by using 'phone, and then gets slam on his modulation. Everybody is admiring W9BPB's beautiful outfit. W9GYC has station in gas-filling station. W9JL is needed on air.

Traffic: W9AUH 412 ZZBZ 219 OX 174 CIM 136 FQQ 107 HAX 70 BAN 69 CNE 50 BJA 49 BAZ 48 JYO 44 ERH 43 EQO 40 FBJ 32 JPM 27 FZL 21 EI 30 ELL 14 ETD 12 FFI 10 CKH 9 EYW 5 IFM 5 IPG 5 GJZ 3 KKG 2 CDA 2.

INDIANA — SCM, A.L. Braun, W9TE — W9ABW has a receiver with new tubes. W9AEB worked a G5. W9AET makes BPL. W9AKJ is having trouble with his dynatron. W9AXH says amateur movies are FB. W9AHA has electron coupled osc. W9BXT is proud of his new amateur 1st ticket. W9BCP reports traffic picking up. W9BKJ has new temp. oven. W9CKG made a fine showing in the S.S. W9CKB is going strong. W9CB is QRL PA. W9CHA says local club going strong. W9DHJ spends most of his time handling traffic. W9DJU cracked his crystal. W9ESU is big shot in A.A.R.S. W9EPT did FB in ORS QSO Party. W9EEO is doing FB traffic work. W9EUJ and W9IOW report for first time. W9EZR is ready for traffic. W9EXL has trouble getting out. W9FQ ops at W9EFO. W9FKE is coming on with a new c.w. rig. W9FIY wants to get in A.A.R.S. W9FSP has 1.75-mc. 'phone. W9FUT went big in S.S. W9FYB is QRL work. W9GGJ and W9JZP are rebuilding. W9GFS is building a dynatron. W9GGP will add 211Es W9HSF says his ant. is no good. W9HKH has new Zepp. W9HPQ is new ORS. W9HIU has the 'phone bug. W9HML has his hat in the ring for ORS. W9HZH wants ORS. W9JPE says someone stole his call. W9JSM is getting to be a real traffic hound. W9JHY took 'phone exam. W9JRK says S.S. is FB. W9KPN's receiver went haywire. W9RS spends 70% of his time on the air with traffic. W9TE worked a K4. W9YB makes BPL. W9KVE and W9KXR are new hams in Evansville. W9ACO makes crystals oscillate. W9AB wants OBS. W9IOB is putting in crystal. W9EMZ and W9KYX are new in Richmond. W9JYU is new in Ft. Wayne. W9JHQ and W9CWE are building new c.c. rigs. W9AMI works plenty DX. W9EJB burnt out a pair of '10s. W9DXH is

having trouble with c.c. rig. W9BQH has QSY to 3.5 mc. W9HUF is experimenting with new receiver tubes.

Traffic: **W9**FUT 1001 YB 661 ESU 305 AET 229 CKB 124 CKG 121 TE 120 DHJ 93 JRK 62 HML 60 EUJ 53 HUO 48 FIY 47 EPT 41 HKH 33 EEO 32 BKJ 32 JHY 29 EXL 23 EZR 22 GFS 22 BCP 19 HPQ 16 FKE 15 IOW 15 JSM 14 AXH 12 AKJ 10 CHA 8 HIU 8 RS 5 FSP 4 GGJ 4 HSF 2 AEB 2.

ILLINOIS — SCM, F. J. Hinds, W9APY — RM N. E. Section Ed Wilcox W9DDE — RM N. W. Section E. A. Hubbell W9ERU. *Fine reports, gang. Keep up the good* work. W9FFQ has a neat rack and panel job. W9GKI is rebuilding. W9JKQ changed QRA. W9DSS has a new MG. W9JLN has '45s PP. W9CZB has an MOPA. W9GRO is run by the gang at KFLV. W9JUQ has a sock in that '10. W9BTQ is building a 211E PP-MOPA. W9KSB is a newcomer. W9DX is doing nicely with his sound truck. W9HQH says, "When bigger and better trades are made — W9DX will make them." W9FOD obtained a 211E. W9DGD is working VKs. W9FDN is going to fix up receiver. W9HWY says, "All the time W9FDN has is 24 hours a day." W9AIZ's first op is back from the Coast. W9IWY blew his 211E. W9HSG is up with the leaders. W9DLA sends first report. *W9FJX* has receiver troubles. *W9IPP* says the Hinsdale Radio Club had a shocking Hallowe'en Party with the aid of a spark coil. W9KHD is rebuilt. A new bug at W9HAW. W9DFH was QSO Martinique. W9ABA has worked VK, ZL, K5, K6 and X1. W9HVA is now ½ KW. W9DMG has new 50-watt crystal. W9JCE works VK and ZL. W9HMB has PP-MOPA. W9SG is the new call of W9IJA. W9FRA says the A.A.R.S. in Chicago is working fine. W9DOU is publishing Sixth Corps Area A-A bulletin, but W9ANR is taking it over. W9IYA and W9IVF will soon have 50-watter. Traffic picking up at W9CZL. W9FGD is trying for a Commercial Broadcast ticket. The Triple R net is in full swing — so says W9BTT. W9KWZ is a new man at Aurora. *W9FGN says contests are lots of fun.* The portable at W9AVB is now c.c. W9EWN says skip plays hob with traffic. W9DZG cracked crystal, blew filter condenser and made '10 turn blue. Twin 7½-pound babies were born at W9HUX. W9IZI is going to join the A.A.R.S. W9IWR will soon be on. W9KJE is a new man. W9JO is 56-mc. experimenting. W9JUC says 14-mc. DX fine. W9KHL is trying to have the busses re-routed to stop QRM. W9BLI is announcer at WJKS. W9JIR is an NBC engineer. W9KEH did fine SS work. W9KIM is using a '45. MOPA working fine at W9GDI. W9BSR's power leak is back again. W9KX is building 56-mc. outfit. W9DPD has re-arranged the station. W9ATS says Trunk Line schedules fine. W9FGV *using a single '45. W9KWP is new man in Glen Ellyn.* W9BPU is installing 7-mc. c.c. outfit. W9EMN joined the U.S.N.R. W9HPK uses the dead feeder of a 66-foot Zepp as the regular antenna on 3500. W9IUF has a c.c. '03-A. W9JLK has a new a.c. Handbook receiver. W9IEP is a *member of the Triple R Net.* W9PK has worked 37 *countries.* W9HFK is getting settled with his key Klix. W9IKM's initials are "I.K.M." W9DBO is back to the old '12-A with 180 volts. W9DCI is experimenting. W9KHG has new receiver. W9CEO is rebuilding receiver. W9ALW works 1.75 mc. W9AWA works 1.75-mc. 'phone. W9FXE has a new '52. DX fine at W9NN. W9HNK says good schedules are hard to find. W9FYZ passed the Radiotelegraph Second Class Commercial. W9TW is on again. W9RO is working on a super-het. W9KA has new dynatron. W9FCW says A.A.R.S. made his total. W9ACU is on 3.9-mc. 'phone. W9CUH has a beautiful 70-foot mast. W9IWZ is ex-8LY, 9CT and W9BRZ. W9FPN is building a c.c. rig. W9AFB says "Crystal Forever." W9AAK will soon add 14-mc. 'phone. W9CYT is working DX. W9CTP changed QRA to 7349 Vincennes Ave., Chicago. W9DGK is using 3503-kc. c.c. W9GYO is on 3536 kc. W9DLA is new ham in Aledo. W9ALA is doing nice A-A work. W9CSB is installing high power. W9FF has finally cured parasitics.

Traffic: **W9**VS 790 FRA 688 CTP 615 ENH 607 HSG 373 FCW 312 BTT 311 CGV 220 CRT 213 NN 211 DOU 195 IVF 187 GVX 139 RT 125 KEH 124 ANR 108 ATS 107 APY 95 EMN 81 EWN 80 HQH-HVA-IEP 73 IYA 71 CUH-FO 60 FXE 59 AFN 56 GYO 53 CZL-FKO 41 JO 39 DBO 37 BPU 34 AMO 29 FGN 28 ACE 27 CSB 24 FGD 23 LW 22 FGV 21 AFB-FYZ-JUC 20 KJE 19 HPK 16 BTU-CEO 15 BYZ-DGK-HFK-HUX 13 AAK 12 FTX 11 ALA-IJA-JCK-JLK-KA 10 DCI-HMB 8 AVB-DZG 7 BXR-HNK-ILH-KIM 6 ACU 4 AMN-AZI-GDI-IPV-KHD 3 BIR-DDY 2 ALW-DLA-DPD 1.

WISCONSIN — SCM, Harold H. Kurth, W9FSS — W9AUX has the largest traffic total. W9HMS enjoyed ORS Party. W9GVL schedules W9ENH and W9BCF. W9DKA is waiting for his crystal to work right. W9FSS and W9EYX visited W9ERS, W9DKA and W9JDP. W9HSK is handling traffic. W9IFV schedules W9JAZ, W9LN and W9HK. *W9IAQ-ZZN has some schedules.* W9ISD has *new Zepp.* W9DXV works 14 mc. W9ERS is QRL college. W9ZY has been remodeled. W9DRO is experimenting. W9GPQ is a member of the Northern Wisconsin Radio Club. W9DIT is chief operator at the NWRC station — W9IFV. W9DNU is working for ORS appointment. W9AVG is trying to interest W9BIB in 56-mc. 'phone. W9HRM has been having rotten luck with his transformer. W9EEQ fails to include news of his station. What is W9IQW doing with himself? W9JDP was in S. S. Contest with W9JXU and W9AUX. W9ESZ and W9HTZ want to see a Wisconsin bulletin again. W9DJQ has his Zepp working FB. W9HFA worked all districts on 14 mc. W9GXI is principal of a school in Cadott. *W9JNU is using a '46. W9IZQ has an MOPA.* W9KJR has been on since September. W9CID has a new rectifier. W9ATO is on Mon., Wed., and Fri. nights. W9GIT reports traffic. W9APB's receiver broke down during the S.S. W9HOR is on 3.5 mc. W9HKL is rebuilding. W9EYH has been off the air. W9IZU has been QRL YLs. W9DKH expects to be on the beach. W9LV is moving to first district. W9CID and W9BJM passed unlimited 'phone exam. W9KNL is Ex-9AWD. W9ENE is on 1.75-mc. 'phone. W9BJD is preparing for exam. W9BUP seems to be losing interest in ham radio. W9AVG asks what's become of W9BSS. W9GTD and W9KQL are building transmitters. W9IHG likes 7 mc. W9JCW is getting good results. W9KTK is a *new ham. W9DJA uses crystal. W9BFM* has been off the air due to a quarantine at his home. W9AFU is district distributor for some line of radio tubes. W9CAZ is back in the Navy. W9EYC is still building a receiver with his YL. W9ATI, W9JYD, W9KQL and W9GTD are new hams. W9HFL received a visit from W9DJQ and W9AUG. W9JWV, W9JFK, and W9DJQ visited the Racine gang. W9IQQ is on the air. W9IYL, W9JLM, W9JCF, W9IHB of Madison are on 1.75-mc. 'phone. W9BIB, W9BFM, W9AFU and W9AVG reported a real hamfest in Milwaukee with W9EYH, W9IH, W9GVL, W9EYX, W9ASL, W9ATO and W9FSS. W9GHN worked a K6. W9BVB, W9EQP, W9ESE, W9AFW, W9ITU, W9GVL, W9GKE, W9NY, *W9XAJ, W9JKI, W9FMI, W9JWZ, W9BYE, W9DFJ* and others of Milwaukee are active on 56 mc. W9AOC worked some fine DX. W9ITZ has a crystal. W9DTK received a promotion to Lieut. senior grade in the U.S.N.R. W9IZT has a strong harmonic of his 1.75-mc. 'phone on 3.5 mc. W9VD has a *new crystal, 3570 kc.* W9KPG is a *new ham.* W9DRO and W9AZN donated some money for "QRZ." W9IFL is putting in a pair of '10s. W9AHJ and W9BXZ are building a c.c. job. W9RH got a high score in the Sweepstakes. W9DGW wants to know if "CQ SS" is a call for all Sunday School members. Hi. W9HFI is off the air for repairs. W9HQK-W2CJV is started on his 31st transmitter. W9EWD is the call of Section 5 Naval Reserve Radio Station. W9EYX is building a crystal transmitter. W9EHD-HA reported his traffic direct to HQ. The Milwaukee Radio Amateurs Club is working mostly on 56 mc. The Northern Wisconsin Radio Amateurs Club has over 50 members. The Sheboygan Radio Amateurs Club has been getting some good speakers. The Four-Lakes Radio Amateurs Club is mostly composed of 'phone men. Amateurs in Appleton and vicinity recently organized the Appleton Radio Amateurs Club. They boast of a fine club house and station. The Burlington Radio Club has been reorganized with W9AHJ President.

Traffic: **W9**AUX 334 HMS 222 GVL 201 FSS 163 DKA 85 HSK 71 IFV 66 ISD 62 IAQ-ZZN 60 DXV 59 ERS 58 ZY 37 DRO 31 GPQ 31 DIT 30 DNU 27 AVG 25 HRM 23 EEQ 20 IQW 19 JDP 18 ESZ 15 HTZ 15 DJQ 12 HFA 12 GXI 11 JNU 9 IZQ 9 KJR 8 CID 7 ATO 6 GIT 6 APB 4 HOR 3 HKL 2 EYH 1 EZO 1 EHD-HA 35.

OHIO — SCM, Harry A. Tummonds, W8BAH — A

gain of 13 traffic reports this month. When reporting please show your district number in the right-hand corner of your report card. District No. 1: RM W8BYD, W8FFK has been rebuilding. New MOPA at W8GTU. W8EBT got married. W8EMV reports activity of new Medina County Radio Club. W8ZZAB is at college. W8RN is still sailing. Mr. M. L. Brown and W8FNX report the activity of the Mike and Key Club at Elyria. This club held a successful hamfest at Lorain, Nov. 1st, with about 125 present. W8HC was the principal speaker. New equipment at W8FGC. W8FFM presses the key and neighbor's lights come to life in upstairs bedroom. W8BFT plays a mean set of drums. W8GQU has a crystal rig. "Busy operating 'phone at W8FJE," reports W8ZZB. W8BRB's MOPA is FB. "100% CW," reports W8GKG. W8ACZ's new rig is mostly meters. Nice report from W8CEJ. More power at W8DQI. W8DVI is a new ham. W8DI is experimenting. W8EFW reports club holding a QSO contest. W8HYB is a new member. New reporter from Chagrin Falls, W8HYZ. W8FNX is Secretary of the Mike and Key Club. W8AOJ is active. W8FJE comes through with a fine total. No schedules at W8BZG. W8HUS is getting out FB. W8UC reported by telephone. W8FVL spends 15% time on traffic. W8HBI was in the S.S. W8FGP had a great time in ORS Party. W8BMX returns. W8GUL is Secretary of the Lakewood Radio Club. W8DAT won 50-watt DeForest 503A at the Lakewood Radio Club Hamfest. W8CIO schedules W8BZL, W8DDS, W8DVL, W8BYD and W8BAH. W8DVL has some real schedules. W8EBY is joining A.A.R.S. W8BAH can help anyone interested in joining U.S.N.R. W8FF is at the Central Y.M.C.A. Radio School, Cleveland. RM W8BYD had an accident. The report and your RM both fell in the mud, and hard to distinguish either of them. General Ohio RM W8DDS has a total of 10,767 in the S.S. District No. 2: RM W8BKM. RM W8BKM reports by radio. District No. 3: RM W8APC W8BIX reports a radio club being formed at Port Clinton. W8BZD is a new reporter lined up by W8APC. W8AND had his ticket renewed. "QRM from Chess," says W8DIH. W8IP likes 3.5-mc. band. Glad to hear from W8BTT. W8GOD applied for ORS. RM W8APC leads his district. District No. 4: RM W8EEQ. W8DTW radios his report. RM W8EEQ has a new rig about finished. First report since 1928 received from W8DEM. And here is a report from W8WE, first since 1926. W8QQ schedules W8AZO and W8EUQ. The SCM enjoyed a fine meeting of hams from in and near Shelby, on a visit to W8PO, Nov. 13th. W8UW is NC for the A.A.R.S. District No. 5: W8FGV is new RM of this district, just appointed due to the resigning of W8DFR. Give him your coöperation. W8HPH handled traffic to Washington, D. C., and had answer in less than 30 minutes. W8EXI is having hard luck with traffic. W8BMK was active in S.S. W8BZL has call WLHC for A.A.R.S. W8DVE has been off several months. W8DFR is awaiting a new call. W8FDV starts off by making the BPL. W8BJU is the HQ Co. 3Bn 145 Inf station at Akron. We are more than interested in the "Amateur Short Wave News" Bulletin published by the hams in Salem, under the leadership of W8CJG. This bulletin is worth writing for, fellows. District No. 6: RM W8BBH. Second report from W8GDC. W8ENH operates the Unit U.S.N.R. station, W8DMI. W8FJN has a real report. W8HKQ applied for ORS. A real report comes in from Windy, W8GZ, for work on A.A.R.S. RM W8BBH has schedules with W8PP, W1MK, W9FHV, W9FUT, W8CGS, W8DLG. District No. 7: RM W8VP. BCL radio service work at W8CKX. A 100-watt c.c. rig at W8FRV. W8ANS has been unable to be on much. W8VP makes the BPL both ways. District No. 8: RM W8CGS. W8BKC is using a '10. W8BRQ is rebuilding. W8EDY has worked 175 stations since Sept 15th. RM W8CGS connects with A.R.R.L. trunk line through RM W8BBH. District No. 9: RM W8AEL. W8FFQ wants to report traffic. W8VR was QSO EAR96. W8EQB has new rig on 7045 kc. W8AEL, RM, is busy building up the district. W9BWJ is now at Ironton, Ohio, using portable W9ZZBZ. The Lakewood Radio Club sponsored a real hamfest at the West Side Y.M.C.A. in Cleveland, Nov. 19th. The CATA Net is being formed in order to have a Cleveland station on the air at all times.

Traffic: W8DDS 951 VP 517 BBH 443 BYD 416 FDV 385 FF 261 BAH 247 BJU 229 GZ 202 BZL 116 EBY 112 DVL 108 BKM 108 FGV 103 APC 92 CIO 91 DAT 76 AEL 68 CGS 65 UW 64 HKQ 58 FJN 56 PO 53 GOD 48 ANS 45 GUL 42 FRV 41 BMK 40 DTW 36 BMX 32 FGP 32 HBI 31 VR 30 ENH 30 EXI 29 FVL-EEQ 26 EQB 23 HPD 32 CKX-QQ 21 BTT 19 UC-EDY-HUS 18 IP 15 BRQ-WE-FJE 14 BZG 15 AOJ 12 GDC-DEM 13 FNX 11 HYZ 10 EFW 9 DI-DVI-DQI 7 CEJ 6 ACZ-DIH-GKG 5 BRB 4 ZZB-GQU-BZD 3 AND-BFT 2 FFM-FGC 1.

MICHIGAN — Acting SCM, Kenneth F. Conroy, W8DYH — Hey, Hey! Michigang copped the banner last month — here's hoping we get it this time! We got 149 reports! with 130 reporting traffic, for a nice total of 8015. W8BIU thinks of going into the crystal business. W8ERX was an active Sweepstakeser. Mr. and Mrs. W8DYH fight so much over the key that results are no pounding! W8HPH makes his bow. W8EZM helps W8EGK break in a new bug! W8EHD still goes on. W8GSP found a job. W8DLX remote controls. W8DMS works 98% time on 'phone — it's police 'phone, WMO. W8FGW & Co. report. W8BUH sends in one of the things that made Rockefeller famous — to keep the Bulletin going — thanks! W8CRP has cold feet — can't even afford to spare sock for his transmitter. W8CEU finds A.A.R.S. FB. W8DA claims a certain guy sent 88 to his (DA) YL. Yeah and the bird (we think) wonders if Detroit has gone nutz on love! W8EVC reports. W8GQS wants a stove. W8FQE sends us a dirtless card — the total's nice, though. W8GHP takes a notion to report. Radio is W8BXJ's latest romance. W8EBQ reports following market news: "YL preferred" stocks going up. W8AYO has a 50-ft. lattice sky-hook — it's kinda wobbly — so lattice pray! W8BJG is getting the urge again! W8HA thinks he got under our hide — wrong again — after all you're still 100% c.w. W8HOT isn't so very yet. W9HXB was QRL farming. W8BIK works hard on crystal and then trades it. Says W8ECN, "W8HOT didn't know how to hook up a 'B' eliminator — he forgot to turn it on!" W8CFZ was saving dough to cut his 500-cycle (or is it kc.) note by filtering it — but had to let loose of one buck to keep the DARA-Michigang Bulletin on its feet. W8QT dirts, "W8EVC finally found a girl. Heard him asking Deacon Darrow, W8AZQ, how to go about it!" W9FSK (spills W8QT) is dickering with W8BMG for that hair-growing machine of Baldy's — W9FSK tore his hair out when some guy scared 250 geese off headed for his blind! (Pig?) W8ALL says the gang took first-class exams, Nov. 3rd. W9KPW wants dope on radiotelegraph second ticket. W8HL wants more A.A.R.S. men. Pardon us, we mean W9BBP had his damper turned up! W8AEQ wants more and more schedules. W8BMG cleaned his shack and is shipping the dirt to W8FX. W8CSR needs filter — he even admits it. W9IJH & W8GDR — the Abfalter Trunk Liners, one crystal, the other EC oscillator. W8DOV wants a BO TC meter, cheap. W8EBB gives us moral support! W9HSQ accuses W9HK for collecting dirt for the scandal-sheet (Bulletin). W8JO claims W8GJK is with the Underwood Typewriter Co. W8EGI handled an important message from Africa. If the BCLs bother you birds to fix sets, get in touch with W8GP & W8AKN, professional set-fixers. W8WO is holding his job only through a lot of pull. W9FBC thinks W8DMS is still SCM — mail cards to W8DYH till. . . . W8BRS is un-hibernated, or sumthin. W8FTV makes the BPL as does W8CST. W8WW ops at W1BM. W8GQB peps up W8FGW, W8AF and W8B(u)NK. W8AF hid his precious crystal in a match box — four-year-old daughter needed a match box — W8AF needs a crystal! W8CST got radio telephone first with a nice 94%. W8DZ needs a job. W8HKT, W8FRF, W8HEX, W8HLC, W8FQF, W8FAV. W8DSQ and W8HZN all make a big bow to their future public. W8PP says that rumor of having a job is the bunque — doesn't want us to chase away prospective employers! W8MV tried a new hook-up — we think it's marriage. Congrats to you — condolences to the YF! W8GBB pushes W8HBZ to the fore. W8FQD is 15 years old. Any younger? Who is oldest? W8DNT is selling eggs — so he puts four on his report card. DARA meets second Thursday of each month at Radio Specialties. For additional dope (and do we have it!) see DARA-Michigang Bulletin — copy free to all stations sending card or letter to Acting SCM W8DYH on 16th each month.

Traffic: W8PP 1340 FX 538 CST 535 FTV 509 FTW

394 BMG 386 BGY 294 AEQ 256 BMZ 231 CEU 164 EGI 148 AYO 129 QT 129 DED-GBB-DNY 125 EGX 69 DCT 61 EVC 59 HBZ 56 EHD 51 EVJ 48 ARR 46 FRW 45 CFZ 39 DMS 39 DZ 37 DYH-BTK 35 GRN 33 GUC 32 EBB 29 ECN 28 HA 26 GTN 25 DOV-BDI 24 BTP 22 HOT 21 FXB-FQE-DLX 20 FQF 19 JO-DA 16 BIK-BUH-AKN-GHP 14 GQB-AZQ-BXJ 12 HKT-WO-CPH 10 FAV 9 EDO-BQN-CUX 8 AUT-HLC-AFH-GQS-HL-DSQ 7 BRS-GMB-GQC-EZM-ERX-BIU 6 FIO-CPY 5 AAF-FRF-AJL-FQD-HHQ-WR-FGW-HPH-GSP 4 CFM 3 WW-AF-CSR-FWG-CEV 2 EBQ-HZN 1 BKU 29 GDR 34 DM 50 NQ 10 DVC 73 AW 39 COW 30 NR 21 ABH 9 DYR 6 CAT 3 BEP 2 DUR 2. **W9**CE 75 DAB 59 HXB 42 FSK 38 HIS 36 EXT 32 CGP 29 GQF 27 HSQ 16 DCN 16 FQQ 15 IHM 14 BBP 13 VL 12 CEX 10 IJH-CWR 9 FBC 5 KPW 4 EGF 2 EEM 1 CSI 53 HK 424 EVI 20 DQT 13 YX 12 GDJ 4.

DAKOTA DIVISION

SOUTHERN MINNESOTA — Acting SCM, Vic Schleuder, W9BKX — W9HCC has moved to Minneapolis for winter under call W9AQH. W9EPJ stays in the BPL consistently. W9BKK's second consecutive month in BPL. W9BN is keeping 15 daily schedules. W9LN is not going at top speed yet. W9BNN makes the BPL on deliveries. W9BKX will make BPL next time. W9BHZ is going well in traffic. W9FCS keeps four daily schedules. W9CSY finds schedules boosting his total. W9AFR blew his tubes. W9IXQ changed to MOPA. W9YC reports staff of 20 ops. W9JID handled police message. W9FNK is QRL U.S.N.R. W9JLV moved to Minneapolis. W9JBA went deer hunting. W9CSU handled birthday greetings to Europe. W9EPD reports W5RR and wife W5CBW now in Minneapolis with call W9EY. W9FFY is on at W9YC 10 to 12 a.m., Mondays. W9LS expects to have c.c. 'phone soon. W9FMA has portable receiver. W9GNU reports traffic. W9CSJ has regular Amateur License. W9GCN says traffic handling FB. W9HMV is having trouble with c.c. W9HRH is active in A.A.R.S. W9IAK correction on QRA, should be 3128 43rd Ave. S., Minneapolis. W9JHG is building dynatron frequency meter. W9ISN reports W9ELA working several Englishmen. Our good SCM, W9AIR, is frozen in fast on Ye Ole Mississippi.

Traffic: **W9**HCC 1323 EPJ 1236 BKK 794 BN 700 LN 416 BNN 406 BKK 315 BHZ 168 FCS 158 CSY 134 AFR 101 IXQ 97 YC 90 JID 80 FNK 51 JLV 35 JBA 33 CSU 32 EPD 31 FFY 28 CPP 28 GLE 25 GUX 19 LS 14 FMA 14 JMV 12 CTB 11 GNU 11 CSJ 10 GCN 9 HMV 8 EVG 7 HZU 6 HRH 6 IAK 5 ?-3 JHG 2 KDI 2 KAV 2 EGG 2 IJN 3 DH 35.

SOUTH DAKOTA — SCM, Carrol B. Miller, W9DKL-W9GIO — W9IDW leads in traffic. W9CFU is putting up new antenna. W9IQD will be on with a pair of '10s. W9DGR has new c.c. rig. W9DNS reports for the SF gang. W9IEK handled funeral traffic from W9DGR. W9DKJ is on mornings. W9EES is awaiting license renewal. W9DJN is experimenting with condenser mikes. W9HHV is building a 1.75-mc. c.c. 'phone. W9FHW is increasing power. W9EER changed QRA. W9CDW is QRL school and BC station. W9FOQ is active. W9AZR and W9ALO are working hard on A.A.R.S. W9GRJ is on 3.9-mc. 'phone. W9GEE's 1.75-mc. low-power 'phone works FB. Ex-W9GNT applied for a new license. W9IQZ was heard in New Zealand on 3.5 mc. W9FNM reports DX good on 7 mc. W9HSP has a new 1.75-mc. 'phone under construction. W9JAA is QRL basketball. W9JLA changed QRA. W9EUH has a c.c. rig under construction. W9GTN will be on 1.75-mc. 'phone. W9DUT's license expired. W9HJU was heard in Australia. W9HHW has a 1.75-mc. Zepp using a 510-ft. flat top, the entire system uses 1016 ft. of wire! W9ERQ will have a 212D in the final stage of his new MOPA. It is with much regret we learn of the death of W9GID at Sturgis. New appointments this month are OBS, W9GQH; ORS, W9DGR, W9FOQ, and W9IEK. W9GEE paid visits to the SCM and W9FOQ. W9FLI moved to Iowa. Sorry to lose you, OM. Thanks for support, OMs. Keep it up.

Traffic: **W9**IDW 313 DGR 115 DKL 76 IEK 68 FKL 55 FOQ 28 AZR 21 ALO 19 FNM 13 HHW 9 IQZ 8 DNS 2. (Sept.-Oct. — received late—: **W9**IEK 103 IDW 81 DGR 30 FLI 17 ALO 14 FMP 3.)

NORTH DAKOTA — SCM, Wm. A. Langer, W9DGS-W9IFW — W9EVQ now has break-in. W9HJC continues to push traffic. W9EGI worked all districts in six hours. W9DYA credits his total to A.A.R.S. W9IK reports the 1.75-mc. 'phone band excellent for DX. W9IHS and W9ENM confirm this. W9BPM has school QRL. W9DOY's report was held over from last month. W9CRL is resuming schedules. W9JVP reports that W9BTJ is on air. Other newcomers heard from include: W9FIV, Bismarck; W9KVA, Nekoma; W9IBQ, Langdon, and W9KRS, Hamilton. W9FSF and W9GCB are becoming regular reporters. W9DM has removed bugs from his buffer. W9IGR is keeping several schedules. W9JZJ's antenna came down with the sleet storm. W9JMW of GF is a first-timer. W9JAR of Milnor is an ORS applicant. W9DHQ is busy with motor repairing. The SCM is catching up on sleep after the S.S. Contest. Ex-W9BPJ is awaiting a license in Wisconsin. W9EJJ reports in person. Let's have more reports next month.

Traffic: **W9**DGS 449 EVQ 289 HJC 247 EGI 121 DYA 118 IGR 107 IK 96 IHS 60 BPM 34 CRL 23 JVP 23 FSF 17 GCB 6 ENM 6 DOY 5 JZJ 6.

NORTHERN MINNESOTA — SCM, Palmer Andersen, W9DOQ — Honors this month go to W9HCW with a total of 171. But sorry to report he is moving back to S. Minn. W9BHH hit the S.S. hard. W9CTW is coming back for Sectional activities. W9HIE broke his crystal. W9GQP is a new "Ham" at St. Paul. W9EHI says, "All Ok — no news." W9CDV is winding pretty coils. W9IJS is looking for DX. W9IPN has portable W9KUE. W9DJW reports a new "Ham," W9JPR at St. Paul. W9EGU is experimenting with a crystal microphone! W9IPA is busy building a new house. W9KVM is his portable. W9GWR is looking for a good traffic schedule. W9KFF is after ORS. W9IAA had an FB visit from W9BKK. W9HZV has been rebuilding. W9HEN has run a schedule for the past year with W9DLH, who contacts HEN's mother for a rag-chew. W9BBL, W9BCT and W9BAR recently dropped in for a visit with W9DOQ. Your SCM regrets there is no special certificate to issue to the Section entertainer. At least 25 reports have given W9BAR recognition as the one who would deserve such honors. W9HDN was QRL S.S. W9HZ is a good outlet for Canadian traffic. W9FNQ razzes the Duluth gang for not being on the air enough. W9FTJ is running a newspaper. W9ISA sends his first report. W9JVV is a new "Ham" in Duluth. W9BRA and W9JCD have several dandy schedules. W9EOZ is still out at Jamestown. W9FNJ revamped his antenna. Look at the dates on your ORS certificates, fellows. Send them in for renewal if they are expiring soon.

Traffic: **W9**HCT 24 EHI 1 BHH 117 CDV 2 IJS 10 BRA 116 IPN 4 CTW 2 DJW 31 EGU 11 IPA 11 HCW 171 KFF 54 IAA 89 HZV 6 DOQ 21 HEN 7 BBL 9 HDN 6 HZ 17 FNQ 18 FTJ 1 FNJ 14 JCD 10.

DELTA DIVISION

MISSISSIPPI — SCM, William G. Bodker, W5AZV — W5ID, W5BUI, and W5ARJ are new A.R.R.S. W5CFL is active on 3.5-mc. c.w. W5BXZ left to enroll for a course in radio in the Port Arthur College. W5VJ has completed a new receiver. W5CLD reports trouble with his crystal oscillator. W5BTL is coming back with '03A output c.c. The SCM's address is now 1013 Bratton St. Please address correspondence there.

Traffic: **W5**ANX 95 BUI 157 ID 9 CFL 3 CLD 23 BJO 75.

LOUISIANA — Acting SCM, W. J. Wilkinson, Jr., W5WF — We regret to announce the resignation of Frank Watts, Jr., W5WF, as SCM and to thank him for his services during the past three years. Until another SCM is elected send your reports to 1624 Allen Ave., Shreveport, La. W5YW worked J1EE and OA4AI. W5BPL and W5HR get traffic via 'phone. W5BYX wants schedules with all sections. W5AO and W5BUK have combined and use call W5AO. W5BID reports a nice traffic total. W5BZR worked all districts in two hours and five minutes. W5AQC chose between radio and OW and the OW won. W5BBW is on 1.75-mc. 'phone. W5APA has a pair of '52s. W5CMQ has everything but a grid leak. W5CEN is pounding away. W5BFB is working them far and wide. W5CW got tangled with his power supply and it knocked him cold. W5BYQ

still works them. W5AYZ will be on soon. W5KC reports traffic. W5FR is on 'phone. W5WF hit the Sweepstakes full force. We want more traffic. Don't forget to report on the 16th of every month.

Traffic: **W5**BPL 5 HR 12 YW 12 BYQ 16 APA 18 BYX 26 BID 28 BZR 60 BYY 35 KC 27 CW 46 AO 62 WF 110.

ARKANSAS — SCM, Henry E. Velte, W5ABI — W5PX has left the state. W5ABL gets out well. W5AAJ and W5GN report by radio. W5BUX is rebuilding. W5CR reports. W5IQ hands in a nice traffic total. W5BXM is located at Fayetteville. W5LV is working three bands. W5BZK sends first traffic report. W5BSG was on during Sweepstakes. W5BRI says, "Nearly sober for month, Hi." W5ANR reports from Alma. W5JK will work four bands. W5CCY has gone to Port Arthur College. W5NJ is a new station at DeQueen. W5BED hands in a nice traffic report. W5SI reports things running smoothly. W5BJF reports traffic. W5FM has moved. W5APZ is on again. W5ASN has National SW3. W5ABI is still alive. W5BMI hands in a traffic total to be proud of. A total of 1373 messages handled in one month! We challenge any other Section in the Delta Division to a Traffic Contest. What say, fellows? Will be looking for your reports next month, OMs.

Traffic: **W5**BMI 1373 IQ 304 BED 253 LV 125 ABI 122 PX 99 AAJ 94 BSG 81 CR 79 SI 57 JK 51 BJF 46 FM 27 BRI 23 BZK 18 BUX 14 BXM 9 ANR 6 YM 2 GN 1.

TENNESSEE — SCM, F. F. Purdy, W4AFM — W4EX leads the Section. FB, OM. This month surely finds Tennessee hams taking on active interest. W4HA is Tennessee's key station on Trunk Line "E." W4RO and W4OV passed exams at Atlanta. W4BFH collects traffic with a couple of '47s. W4PL will sojourn in Florida during December and January. The Johnson City hams have organized a club and have 15 members. The officers are: W4ADX, Pres.; W4ABX, Vice-Pres.; W4BGQ, Secy.; W4AND, Treas., and W4APF, Activities Mgr. W4AAO has organized a code class with 10 members. W4AYU is awaiting license renewal. W4ABQ is QRMed by illness. W4AGW is the District NCS of the Western Tennessee A.A.R.S. The state c.w. and 'phone net is working 100 percent. W4ACT announces the arrival of a YL and says she is already yelling CQ. W4OV is in the radio service game. W4BDB visited W4PL. The Chattanooga hams have a fine club and meet the last Friday of each month. Their officers are: W4AM, Pres.; W4IB, Vice-Pres.; W. F. Gamble, Secy.; W4BOZ, Treas., and W4LU, Traffic Mgr. W4AM has added a new buffer. W4MU put up a new sky wire. W4BBT has forsaken 'phone for c.w. W4FR is back after a year's absence. W4PZ is now located at W4MU's. W4BDB is on 3.5 mc. W4ARE says 7 mc. is the berries for DX. W4AAD has an FB remote control system. The SCM wants to hear from every Tennessee radio hound interested in amateur activities whether they own stations or not. Your correspondence will be answered!

Traffic: **W4**EX 294 HA 146 PL 139 AAO 108 RO 68 BFH 62 ADX 50 MU 37 BGQ 26 AFM 25 ABX 21 OV 19 FR 18 ABQ 17 BBT 15 AAD 14 AYU 10 BDB 9 LU 8 ACL 6.

HUDSON DIVISION

EASTERN NEW YORK — SCM, R. E. Haight, W2LU — Your SCM will award to the E.N.Y. Section station handling the largest total of traffic beginning Jan. 16th till Feb. 15th a useful prize which has been donated by our Director, Mr. Walsh. Only A.R.R.L. members can enter. We welcome to BPL none other than W2BZZ. W2BJA, Chief RM, reports FB total. W8AJ and W2ADM visited W2LU. W2CQH was in the S.S. W2UL lends a hand in rebuilding W2AE. W2ACD was disappointed not to see his call on ORS Party list. W2ENY, Ex-W2ZZDJ, is new ORS. W2BJP reports nice total. W2ANV is active in U.S.N.R. and A.A.R.S. Our best wishes, W2DQD; will be looking for you back soon. W2DVY joins ORS ranks. W2BVR has portable W2ZZFL. W2ATM changed QRA to 262 Drake Ave., New Rochelle. W2DRC, Ex-W8BAU, is keeping schedule with home town via W8DII. W2BJX is back on 3.5 mc. W2DTB, ex2AQV, makes first report. W2CJP is busy putting W2ENR on air (SARA Club Sta.). For good radioing and deer hunting call on W2KW. W2CTA put in c.c. W2BLL reports new MOPA. W2ACY reports QRM on QRT's DX. For that hole through your stone cellar wall call on W2OP. W2BER is revamping to MOPA. W2DMH is heard often. W2QY is coaching the boys to get that pigskin over the mark. W2CJS is trying TNT. W2SZ is inactive. W2DQT is using '24 Electron coupled Osc, '46 Buffer, '10 final Amp. W2ENC erected 70-ft. mast. W2DUG is heard with a new transmitter. W2BIA was nominated for SARA Pres. W2BKW is c.c. on 3530 kc. W2ENP is new ham in New Rochelle. W2DIJ hit the Sweepstakes. W2CFU is QRL working.

Traffic: **W2**BZZ 531 BJA 372 LU 205 CQH 155 UL 147 ACD 90 ENY 85 BJP 77 ANV 77 DQD 77 DVY 76 BVR 73 ATM 71 DRC 46 BJX 40 DTB 29 CJP 18 KW 15 CTA 15 BLL 14 ACY 12 OP 10 BER 9 DMH 7 QY 3 CJS 2 ENC 52 DIJ 55 CFU 14.

NORTHERN NEW JERSEY — SCM, Walter A. Cobb, W2CO — For the fourth successive month this Section doubled its traffic total! Chief credit for our standing goes again to W2DIU. Runner up is our RM, W2BPY. A good third is W2TP. W2DPB is getting out FB on 14 mc. W2CJX doubled his traffic total in the ORS Party. W2AMR is experimenting. The Newark Amateur Radio Association helped W2EPR and W2EMM get their licenses. W2CIZ keeps portable W2ZZW working on 3.5 mc. The need of a '10 keeps W2CIM from putting his rig on 14 mc. W2BPG wants a schedule with Cleveland. W2CGG is batting them out. W2AIF has hopes of making BPL. W2DMG wants schedules in all directions. W2CDP, Ex-2BGG with spark in 1921, reports. W2WR threatens to get on the air as actively as he was ten years ago! W2ABT spends 99 percent of his time swapping fables with Aussies. The Union County Amateur Radio Assn. is holding regular meetings; W2DZS is engaged in lining up technical speakers for the bunch. W2ELJ is a newcomer in Matawan. In the same town, W2EJK is batting them out. Another old time of 1915 vintage comes to life in the person of W2BYJ. All messages going through W2BXM are handled on schedules. The world's record for proximity of stations is held jointly by W2EIC and W2CTV, the two transmitters being located exactly 5 feet 7 inches apart. W2WC is QRL WCDA. W2WY is being remodeled for higher power. W2HL is striving for maximum coverage with minimum watts. W2TK is using the same MG he used in spark days. A new 14-mc. 'phone rig engages the attention of W2BUX. W2WB has been brushing up on his Morse. W2CTU got his crystal rig on the air. How to get rid of chirps has W2CWL guessing. W2EKM helped W2EBC rebuild; W2DEE visited along with W2BGJ to watch operations. Another newcomer is W2EJF, Passaic. W2CO moved his receiver and key down to the second floor. W2ALD QSOs West Coast on 3.5 mc. W2AFQ, W3AWT, W3ANP, Ed Felch and the SCM all journeyed down to State Police Headquarters in Trenton, recently, and put on a 56-mc. demonstration. Watch out, ORS, this Section is undergoing a "housecleaning."

Traffic: **W2**BPY 529 TP 256 CJX 92 AIF 68 AMR 61 CIM 39 CIZ 12 DPB 7 WR 1 DIU 1902 EJK 104 EKM 87 EIC 25 ALD 24 BXM 61 CGG 21 ABT 16 CO 11 BYJ 10 ELJ 8 CDP 5 EJF 3.

NEW YORK CITY AND LONG ISLAND — SCM, M. J. Grainger, W2AUS — The great work done by RMs, W2AZV, W2QM and W2WP results in the biggest month ever for this Section. New York City and Staten Island: W2WP makes BPL with high total for Section. W2AFV is back after three years' silence. W2BMH is now eligible for ORS. W2BNL reports 56-mc. work. W2AOY is on inactive list. W2AWT changed QRA. W2SC reports broken cable for remote control equipment. Brooklyn: W2DBQ makes the BPL! He is doing FB with L. I. Trunk Line. W2ASG has MOPA. W2BAS schedules FLA. W2AZV reports new remote control outfit. W2BEG reports construction of new all-band transmitter. W2LB keeps Navy schedules. W2COH increased power. W2CCD has a nice traffic total. W2PF is making 56-mc. tests from an Army plane with W2RZ and W2BNY using call AW-1. W2CEF is "Chevvying" to and from a 500-watt station in Queens. W2HO is on again. W2BKP says U.S.N.R. keeps him busy. W2BXJ has a piece of tourmaline. W2TI reports for first time in years. W2EM reports traffic. W2BHP reports a new low total. W2CUD is learning to be admiral. W2BWW is after ORS reports. W2BPJ reports schedules with W1EMF and W1AMP. W2AAK is a new reporting station. W2AQN reported direct to HQ. Bronx: W2QM vows he will fix the fellow who uses his

call with raw a.c. WB5GO now has five transmitters. W2FF schedules Jamaica, B.W.I. W2APV reports another schedule with B.W.I. W2CBB has new pentode receiver. W2CYX asks those interested in joining the VCR to please communicate with him. W2DUP becomes eligible for ORS. W2DOZ handled church bazaar traffic. W2DCF is a new reporter. 2EAF sends in FB report. Queens: W2ADQ handled traffic for President Hoover. W2AIQ is recruiting for A.A.R.S. on Long Island. W2DQK has a high total. W2CUH reports four daily schedules. W2COI reports. W2BDR, at college in Iowa, talks to his OM at home via W9JI and W2COI. W2AGL reports BCL QRM cured. W2DPU reports traffic slow. W2DMN reports heavy Canadian schedules. W2AWM moved to Queens. W2API is active in Astoria. W2AUS is QRL rebuilding, working SS, and contacting hams. 2BVB made personal report. Long Island: W2VL reports as usual. W2BVL has 200 w. input. W2DOG has increased power. W2BRB is now located at Bellmore. W2CHK spent some time on 'phone. W2CFH says 3.5 has 7 mc. stopped. W2DJO reports success on 3.5 mc. W2BWD wants OBS to slow down when transmitting. W2CYA has portable W2EOJ. W2LR reports blown tubes. W2CJ reports poor traffic. W2BST admits handling traffic. Watch those poor notes, fellows.

Traffic: **W2**WP 626 ADQ 438 DBQ 334 DQK 261 AZV 118 BXJ 41 DUP 57 ASG 73 CCD 20 BMH 32 PF 83 BPJ 28 AFV 469 CEF 11 BVL 35 AIQ 92 BEG 1 VL 60 FF 28 APV 26 LB 22 COI 18 DPU 21 DMN 31 COH 10 TI 1 DCF 27 CBB 29 DOZ 60 HO 1 CYA 17 BKP 2 AOY 1 CEM 4 AGL 4 CHK 17 CYX 38 BAS 23 BHP 2 CUD 1 DJO 8 AOY 1 AUS 294 BNL 1 BWD 10 AAK 11 BRB 1 DOG 50 CUH 129 BWW 55 BGO 93 EAF 60 QM 86 AFG 3 DBA 1 BWL 2 BST 10 LR 41 CFH 15 AQN 31.

MIDWEST DIVISION

KANSAS — SCM, O. J. Spetter, W9FLG — E. Crockett Jr., W9KG; C. G. Train, W9CFN; RMs. The Kansas gang are settling down to some real traffic handling. Kansas ORS Party has been resumed. It is being held on Sunday afternoon. W9CFN has offered a type '27 tube to the amateur working most stations Sunday afternoons for the period of Nov. 16th to Dec. 15th. W9KG leads the state and wins Kansas Traffic Banner for next three months. W9BTG has been confined to bed. W9IEW promises big things. W9IOL, W9KSY, W9BUY, W9HLE, W9HJF and W9CSK are new reporters. W9GXV reports new call in Hiawatha, W9KUP. W9PB reports Hiawatha Amateur Radio Club has new quarters. W9BSK reports the Sunflower Amateur Radio Club elected the following officers, Nov. 6th: W9GXD, Pres.; W9IXE, Vice-Pres.; and W9FMX, Sec. W9IQI-ZZCH keeps 35 schedules a week. W9BFH is after Kansas Traffic Banner. W9AWP worked G5SY with a pair of '45s. W9HWW has new op. who is a former commercial operator. W9ESL is making use of his dynatron. W9GCL was busy in Sweepstakes. W9GHI is on 14 mc. W9KWA, Ex-DFY, is back with us. W9IOL is Ex-NNCAB Ex-NN-FX. W9COA, W9KCR, W9BUY, W9FRC and W9ABR are ORS applicants. W9CMV's QRA is Pittsburgh. W9EDU is trying 1.75-mc. 'phone. W9FFO is attending C. of E. at Emporia. W9GUS is having trouble with a.c. receiver. W9DEB has moved again! W9CET has new crystal. The Kaw Valley Radio Club meets every second and fourth Wednesday night at 7:00 p.m. When in Topeka on any of those times, drop in on them at the Chamber of Commerce.

Traffic: **W9**KG 630 BFH 625 FLG 412 CUF 216 KCR 171 CFN 166 IQI 144 COA 140 KDO 117 HSN 70 GUZ 63 CKV 56 PB 52 CNW 47 DVQ 47 IOL 42 EFE 41 FMX 41 BYM 35 BSK 29 FRC 28 KFQ 26 IQV 26 GCL 26 HL 19 BTG 19 IEL 15 ESL 15 KSY 14 IEW 13 AWP 11 BUY 8 ABR 8 HWW 5 HLE 5 BGL 4 HJF 4 CSK 3 GXV 26 JVC 15.

NEBRASKA — SCM, S. C. Wallace, W9FAM — W9BNT leads in traffic. W9DMY is a high second. FB. W9DHA is cussing old man skip. W9FUW is putting in remote control. W9FAM is pounding away. W9HYR is trying to put Lincoln on the map. W9EHW keeps Eastern Nebraska going. W9EWO is having trouble with transmitter. W9BQR is plugging away. W9DGL is our champion DX hound. W9BBS wants get the sheckles while getting is good. W9DI is trying to put some pep into the gang. W9EEW is on the job. W9FGS busts loose with a fine total. W9HTU is having power line trouble. W9BB and W9FZX are doing nice traffic work. W9IFE is making the fur fly. W9CWM is helping line Lincoln up. W9EDI is rounding up the Lincoln gang. W9IFZ is trying to line up the bunch in Omaha. W9EKP is starting in the traffic game. W9ATB is rebuilding. W9EOL will soon be on. W9FBB is getting started. W9EKP has a '52. W9DYU is now W6FBX at Salt Lake City. W9HBE is moving his station to his home. W9ISJ reports that W9IRZ, W9KLD and W9BCX will help all they can. W9DFF reports power trouble. W9GKZ is attending school. W9FVE reports.

Traffic: **W9**BNT 673 DMY 342 DHA 242 FUW 206 FAM 155 HYR 119 EHW 51 EWO 14 BQR 11 DGL 11 BBS 1 ISJ 1 FGS 172 HTU 148 BB 141 IFE 62 FZX 142 EDI 53 CWM 6 IFZ 12 EKP 5 FVE 4.

IOWA — SCM, George D. Hansen, W9FFD — W9BPG, RM; W9EIV, RM. Up the hill we go! W9EIV leads with a BPL total! W9BWF comes in second. W9FFD is third thanks to A.A.R.S. and U.S.N.R. W9BJP returned from Chicago with a 1st-class ticket. W9IO has a good bunch of ops. W9CWG is Alt SNCS A.A.R.S. W9FYC reground the crystal. W9ABE is QRL. W9IFI is holding good schedules. W9ACL is QRL duck-hunting. W9AHX went strong in SS. W9GWT has a YF. W9BPG is now c.c. W9ERY is planning schedules. W9DUN has designs on ORS. W9DUE qualified for ORS. W9DMX is on 1.75 mc. W9FZO engineered the Founders Day Banquet of the TSARC. W9DEA soon will be hot. W9JXO was in on the SS. W9GQI holds A.A.R.S. schedules. W9AFQ had tube blowout. W9DLS reports from Okla. W9FEB is rebuilding receiver. W9EOE is QRL corn husking. W9FYX is a new reporter. W9DJX schedules with A.A.R.S. W9JSO is working on c.c. W9EFU is building MOPA. W9HLG is rebuilding transmitter. W6ZZBL, portable of W9AHX, handles a few. W9EHX reports new U.S.N.R. station will soon be in operation with call W9NS. W9JZM reports a bunch of news. W9CS, W9JMB, W9IYE, W9DWH, W9AXD, W9EJY and W9JAD are all reported to be active. Let us all get together and win that Midwest Banner.

Traffic: **W9**EIV 516 BWF 251 FFD 200 BJP 143 IO 143 CWG 130 FYC 128 ABE 127 IFI 87 ACL 86 AHX 86 GWT 71 BPG 63 ERY 56 DUN 42 DUE 40 DMX 37 FZO 27 DEA 20 JXO 21 GQI 20 AFQ 19 DLS 16 FEB 15 EOE 13 FYX 12 DJX 11 JSO 10 EFU 7 HLG 6 JZM 2 CYL 70 W6ZZBL 4.

MISSOURI — SCM, C. R. Cannady, W9EYG — RMs: W9FTA, Harvey Glatstein and W9PW, H. J. Becker for Eastern Missouri and W9BMA, Denzil Lane for Western Missouri. Still on the UP! Let's keep up the good work and WIN this intra-Divisional traffic CONTEST! W9EYG again led the Section in traffic with W9BMA leading the month's ACTIVITY CUP RACE. W9FTA and W9CRM continued to exchange their lead in the year's CUP standing — W9FTA dropping W9CRM to second position by .8 of one percent. St. Louis: W9GTK-ENK is back at work. W9CCZ is moving. W9ILI is trying 14 mc. W9KIK has new power supply. W9BAF is 3.5-mc. man. W9FAB returned to 14 mc. W9AAH made an FB display of his rig at the Boy Scout Merit Badge Show at the Arena. W9GCH wants schedules. W9HVP is rebuilding. W9FZJ has new a.c. receiver. W9GIH is a new 30-year-old ham. W9AOB goes back to 3.5 mc. W9KSX, W9AAL, W9KHU, W9KIS, W9KEI, W9KIJ, W9KIU, W9KIB, W9KFL, and W9KEG are new St Louis hams. W9APW has a '52 going. W9TA has the c.c. rig working FB. W9FUL, W9CLT, and W9EPE are reported by W9HVJ. W9HWE was appointed OBS. W9IJW took part in Sweepstakes. W9EFC is carrying five schedules. W9HUZ is QRL work. OBP: W9BGE-KJK put up a new 50-footer. W9PW is on low power. St. Louis Amateur Radio Club: W9GDU is out of work. W9DUD-EWT has lots of work. W9FTA gets lined up in RM duties. W9DGI is sporting a 50-watter final. W9HVC is teaching his YL the code. W9GTF spent three months hunting receiver bugs. W9KIK is using a 3.5-mc. job. Let us pause for a moment with reverence for W9FBO, Willard J. McElree — also known as operator at W9DWB and W9YY — who was recently killed in an automobile accident. Kansas City: W9RR reports the U.S.N.R. now has a motor launch, U.S.S. *James R. Parish*, on the river at K.C. W9ZZ, W9CFL, W9JPC, and W9NP are all traffic stations.

W9AUC sends first report. W9EL reports no DX on 7 mc. W9GCG is rebuilding. W9FHV got 8 messages from CHINA ONLY ONE DAY OLD! W9IMZ, W9IPL and W9FCF are on 1.75-mc. 'phone. State News: W9GQY is planning a 1.75-mc. 'phone. W9JVL is a first-timer from Mt. Vernon. W9DCB is the same from Columbia. W9JBZ reports VE4 best DX. W9JYC is trying to sell out. W9COZ is building new rig. W9JMM is first-timer from Aurora. W9DVV reports "SS is swell." W9FSU is building an a.c. receiver. W9ARH-KVN is now on at Kirksville. W9HNM is another "Sweepstaker." W9KCG is trying 14 mc. W9FYM remembers to report. W9ECE has seven schedules. W9GEF and W9ECE took amateur exams. W9CZI blew power transformer. W9IOU comes back with traffic. W9BGS is finding more time. W9JBV hooked a CM. W9ENF is an A.A.R.S. W9IGX holds to 1.75-mc. 'phone. W9CRM finds traffic getting better. W9DHN reports some talk of organizing ALPHA SIGMA DELTA, National Radio Fraternity, at Columbia — M.U. W9HVW comes back with MOPA. W9INI left for California with W9ZZCA for winter. W9ASV hopes for more time. W9AIJ is coming on with c.c. rig. W9FJV gets lots of Army Amateur traffic. W9FSL is hunting bugs in his new c.c. rig. Hannibal Amateur Radio Club: Five members of the club attended a meeting in St. Louis preparing for the BIG MIDWEST DIVISION CONVENTION IN '33. W9KEM — the club station — is getting some schedules. W9GBC and W9FSZ are leading the club QSA Card Contest! W9BAF of St. Louis and W9AEX of Quincy, Ill., visited W9CNS and W9IRR. W9CJH is visiting the club. W9FSB seems to be the prize "parts collector." W9FSB persuaded W9FGJ and W9KNH to attend church with him! W9HSZ is active in American Legion work. South Missouri Association of Radio Amateurs: W9HUG inquires about ORS. W9GBJ is a Sweepstakes contestant. W9FEH-CJR is QRL court. W9DUM gets on at Missouri School of Mines with three ops — xW6DMK, xW5CJH, and W5PA. W9FUM is rebuilding. W9IXO is trying 14 mc. W9FYU says stick to 3.5 mc. W9EHS is recovering from the ceremony. W9CXB continues with 1.75-mc. 'phone. W9GAR has new rectifier. W9FVM-CON paid a visit from Arkansas U. DON'T FORGET THE CONTEST!

Traffic: **W9**EYG 821 BMA 328 FJV 303 FHV 204 FSL 185 AIJ 159 NP 141 ECE 138 FTA 138 GBJ 117 GBC 116 HNM 102 EFC 98 CRM 86 ENF 81 JBV 79 IJW 44 HWE 38 CJR 32 IXO 28 IMZ 27 GCG 26 HUG 23 HVC 22 FSU 22 HCP 21 DVV 21 JPT 20 RR 18 EHS 17 JYC 17 FYU-JBZ-HUZ-AQX 16 DCB-GQY 14 JVL 13 DUD-FSZ 12 HOZ-DOE-HVJ-BC 10 IOU 9 BGS-EL-CFL 8 AUC 7 GTK 6 FYM 5 BGE-FAL-FKF-HUI-GIH-UC 4 ZZ-ANG 3 APW-KIP-PW-COZ-JMM-FZJ-HLK-FEH-INX-KCG-JLE-EWT-KLJ-KJK 2 ENK-JPC-CCH-DUM-KNH-IRR-CJH-GLY 1.

NEW ENGLAND DIVISION

NEW HAMPSHIRE — SCM, V. W. Hodge, W1ATJ — W1DMI's 1.75-mc. 'phone is working FB. W1EES is using an 83 mercury rectifier. W1BAC is trying 7 mc. W1CVK is on 3532.5 kc. W1CGH and W1CGY are operating at W1EDT. W1IP has been busy. W1AEF is on 3500 kc. W1CJO is building new receiver. W1AXL is keeping daily schedules. W1CCM's 3963-kc. 'phone is working fine. W1BRT has been experimenting with his brother, W2DJA-W2ZZFE, on 56 mc. W1DNC plays chess with W1CIG. W1AEF, W1CEA and W1IP visited W1ANS. Ex-W1AYJ is now W1FCI in Intervale. W1APK had some fun in the Sweepstakes. W1UN reports the new station on summit of Mt. Washington, W1FEX. W1DNC is holding two code classes a week at St. Paul's School.

Traffic: **W1**UN 185 APK 137 IP 99 DNC 84 EDT 60 AXL 54 BAC 36 CVK 12 AEF 2 EES 9 DMI 31.

VERMONT — SCM, Roy L. Gale, W1BD — W1ATF forges to the front. W1ERJ and W1CGV joined the A.A.R.S. W1BDX talks of selling out. W1BJP reports activities of several hams in his vicinity. W1DHX sends a good report. W1DGU is on regularly. W1AXN is renewing O.O. activities. W1AHN oscillates between ham radio and blondes. W1AOA visited WDEV and found that the op there has the call W1DOA. W1BAS and W1BCK are all set for A.A.R.S. W1CGX is on a little. W1DAJ says "N.D." this month. W1BZD is doing fine work in the A.A.R.S. The SCM wishes to express his appreciation of the continued loyalty of the gang.

Traffic: **W1**ATF 139 BZD 96 CGV 81 AXN 37 BJP 35 BD 34 DHX 24 AHN 11 CGX 5.

MAINE — SCM, John W. Singleton, W1CDX — W1EF leads off again. FB! W1CRP is still hot after traffic. W1BEZ is discouraged. The SCM took a crack at the S.S. W1BOF is working hard to keep the Trunk Lines in perfect order. W1CHF is among the leaders. W1BLI is busy these days. W1APX was in the S.S. W3CBF is operating W1OR at Bowdoin. W1BUO has a nice total. W1BYP handled a good string. W1EEY has been helping W1DOZ get going. W1CIP was at the Waterville Hamfest. W1APR is pushing traffic to beat the band. W1ATO reports a nice total. W1BNC has a couple of good schedules. W1DHH has portable W1FHL. W1BEU showed the gang at the Waterville Hamfest how to tune a transmitter. W1DAW will soon be ORS. W1AQW is rebuilding. W1QH says things are picking up. W1AXJ says all the Belfast gang got their first-class tickets. W1BWB is interested in A.A.R.S. W1CGG reports for W1ERN. The Waterville gang staged a very fine hamfest Nov. 10th. Miss Eva R. Perkins is interested in forming a "Wives and Mothers of Radio Amateurs" organization in Maine Section. Miss Perkins, incidentally, will soon be Mrs. W1CDX. W1BKU and W1DIJ report.

Traffic: **W1**EF 225 BEZ 156 CDX 209 CHF 113 BLI 126 APX 89 OR 85 BUO 73 EEY 59 CIP 58 APR 54 ATO 54 BNC 53 DHH 42 CGG 30 BEU 28 DAW 21 DIW 20 BYP 71 AQW 12 QH 6 AXJ 3 ERN 6 BWB 3 BOF 142 CRP 205 CFG 162 CPT 37.

WESTERN MASSACHUSETTS — SCM, Earl G. Hewinson, W1ASY-W1RB — W1BVP and W1ASY had a great battle for Sweepstakes honors. W1EFM took his exam for amateur first. W1DCH worked his '10 hard during the SS. W1BCX has new c.c. rig. W1AJD is crying for schedule. W1AZW, RM, gets his traffic from China. W1COI reports W1FFJ and W1FGP new hams in Adams. The H.V.R.C. has moved to the attic of the police station. W1CPU reports new ham in Worcester, W1EKK. W1BXF sends in resignation as ORS. W1DLD reports Nebr. for DX on 35 mc. W1BWY, Springfield Radio Assn., has just been made D.C.S. in A.A.R.S. W1DVW makes first report. W1DGW finds that poison ivy and dog wood makes poor fuel. W1APL has a new 7-mc. hertz. W1ETC is new in Worcester. W1EOB says traffic handling is fun. W1BNL wants schedule with West Springfield. W1CCH is raising power. W1AQM is still working on 56 mc. W1BVR says progress slow on his c.c. rig. W1DIE reports by radio. W1DCF loaned his receiver to W1ASY for the S.S. W1CCS is asking for sky hooks for his antenna. W1EJE and W1AUQ have "amalgamated." W1BSJ is designing an electron-coupled oscillator for his portable. W1BPN has come back to radio, his first love. W1CWP is Chicopee's only ham. W1CIZ reports the "Paper City Dial Twisters" have disbanded. W1ASU says that the U.S.N.R. has moved to Fleet Armory, Worcester. W1CTK reports for the Williamstown gang. W1ETY is QRT due to his mother's illness. W1NH has a homemade condenser mike. W1AVU has an '04A on 7 mc. W1VC has gone on 14-mc. c.w. W1BKS promises big things. The W.M.A.R.A. has applied for affiliation with the A.R.R.L. Reports were received from W1ARH, W1OF, W1AFI, W1TX, W1DJQ, W1EJM and W1APP.

Traffic: **W1**ASY 362 EFM 158 DCH 45 BCX 108 AJD 103 AZW 100 ARH 76 COI 69 AIC 68 CPU 66 OF 61 AFI 59 BXF 62 TX 53 BWY 45 DVW 34 DGW 30 APL 30 ETC 30 EOB 29 BNL 28 CCH 27 AQM 25 BVR 23 DIE 35 DCF 15 DLD 11 CCS 11 DJQ 11 EJM 10 AUQ 7 BSJ 6 BPN 5 CWP 3 CIZ 3 ASU 2 AWW 75 BVP 346.

CONNECTICUT — SCM, Fred A. Ells, Jr., W1CTI — W1CJD maintains his position at the top of the list. FB, Gil. RP at W1MK says Sweepstakes Contest woke up the gang. W1BDI makes BPL on deliveries. W1AMG is active in U.S.N.R. W1AFB promised a letter to follow his traffic report. W1BFS is on 3.6 mc. in Mystic. W1DGG is building a new electron coupled job. W1ES bats 'em out in fine shape. W1DOW says the first hundred is the hardest! W1CIG at Taft played chess by radio with W1DNC at St. Paul's.

Taft won in ten moves. W1BHM was busy in the S.S. W1QV is arranging schedules with ZL and EAR. W1CTI wants to know if anyone has some good high voltage filter condensers they want to sell cheap. W1APW paid a visit to W1CBA. W1DMK says he gets on for U.S.N.R. drills. W1AVB's crystal still perks OK after grinding it with tooth powder. W1EAP was appointed ORS. W1DGC schedules W2ZZDJ. W1CDS is trying some test schedules. W1TD is getting out OK at last. W1ERU spends part of his time on 1.75 mc. W1BIQ worked his first CM. W1BNB says it is too cold in his shack to keep schedules. Following report traffic: W1BWS, W1BDS, W1CJA, W1ABN, W1FDM, W1BAX, W1CTO, W1HQ, W1ESD, W1CUH, W1DF, W1UZ, W1DBU, W1CVD, W1DCI, W1BMP, W1ASP, W1AJB, W1BYW, W1EAO, W1EFW. W1CNU has been appointed O.O. W1AUK reports by radio. W1APZ was laid up in the hospital a couple of weeks. W1AHC has a new rig on the air. W1BQS passed unlimited amateur 'phone. W1YU makes the BPL on deliveries. At a recent meeting of the Yale Radio Club, Mr. J. V. L. Hogan talked on "The Development of the Superheterodyne." About 50 hams were present and enjoyed the get-together. The Twin City Radio Club, W1GB, had a 56 mc. QSO with W1XL in a plane at their sixth annual banquet, Nov. 20th. About 50 amateurs were present and enjoyed the affair. The TCRC hold meetings every Tuesday evening at their club rooms, 416 Howard Ave., New Haven. Visitors are always welcome.

Traffic: **W1**CJD 848 MK 583 YU 400 BDI 318 AMG 247 AFB 223 BFS 202 DGG 171 ES 145 BYW 147 DOW 100 CIG 92 GHM 73 QV 64 AJB 62 CTI 51 APW 37 ASP 36 DMK 33 AVB 33 AUK 31 EAP 22 BMP 20 DGC 19 DCI 19 CVD 17 CDS 16 DBU 15 UZ 13 DF 13 CUH 12 TD 12 ESD 11 ERU 9 HQ 9 BIQ 9 CTO 8 BAX 6 FDM 6 EAO 6 ABN 6 CJA 6 BNB 5 BDS 2 APZ 12 EFW 5 BWS 58.

EASTERN MASSACHUSETTS — SCM, Joseph A. Mullen, W1ASI — The ether reeks with traffic as W1VS swings the Section down the avenue with the season's high traffic mark. Close behind comes a new reporter, W1CD, followed by W1BGW. W1ASI rebuilt the 50-watt job. W1BBY showed up in the press for a message he handled. W1LM finds traffic scarce. W1BFR has a new sky wire. W1WV is back again. W1BMW reports Navy activity. W1AGA made a gift of his appendix to a New Bedford Hospital. W1BZQ says traffic is on the increase. W1KH has worked 26 stations on 56 mc. The depression has a grip on W1ABG. One dark night recently a "friend" loosed all W1COX's guy wires, and he just caught the stick before it fell. W1CCP is getting back into ORS form. W1CHR has been busy helping get W1WV's outfit going. W1DZG says "many called, but few worked." W1CZE is on at last. W1CKR needs more room for his "junk." W1AF president of the MARS is urging use of c.c. W1DFJ and W1DZG are in a Mah Jong Contest with the OWs. W1BYF is getting out FB. W1EHR has a new bottle. W1EMN is pounding out DX on 7 mc. With regret we record the passing of W1EWX, who was killed in an elevator accident in South Boston, Nov. 25th. W1JL is busy with farm work. W1LQ is rebuilding. W1CAW has been playing around 3.9-mc. 'phone. W1WU doesn't get on much. 14 mc. is being upset by W1ME's ether crusher. W1ATX reports another club forming in Norwood. W1ABF is still at sea. W1ALP is now a well married man. W1BFK is due on with a new MOPA. W1QX and W1BLU got rid of their temporary licenses. W1BO is working on a new c.c. outfit. W1EXT has been giving W1RE a lift with his new 48-ft. mast. W1ELL reports having flunked his commercial exam. W1FBI says his specialty is quick deliveries. W1RC gets a little time on 3500. W1DIU and W1BRD hold the record around these parts for long winded QSOs. W1FR has been working some fine 'phone DX. W1VA has his 'phone back on the air. W1AJK is now editor of the Naval Reserve paper, the "Intercept." W1BBX and W1CWA are pounding CQs on 3500. W1DFU has been acting in the capacity of Chief Engineer for W1DMT. There is going to be a house-cleaning party the first of the year on all ORS! Traffic reports received from W1AAL, W1CUO and W1DFS. W1BNU had a house warming on Nov. 21st at his shack. Among those on hand were W1AKN, W1ASI, W1BRB, W1UG, W1VA and W1BNU.

Traffic: **W1**VS 775 CD 162 BGW 124 ASI 122 BBY 85 LM 74 BFR 71 WV 69 BMW 48 AGA 45 BZQ 40 KH 35 ABG 22 CCP 22 CHR 20 DZG 20 EWX 20 JL 19 LQ 16 CAW 16 WU 10 ME 6 ATX 5 AAL 28 DFS 32 CUO 34.

RHODE ISLAND — SCM, N. H. Miller, W1AWE — W1BUX is working the world. W1CAB is QRL U.S.N.R. W1AWE is QRL BCL business. W1II-W1ZS is starting up for the winter. W1EOF and W1CGO are new ORS. W1DDY, W1BOP, W1BML and W1AXS are heard on U.S.N.R. drills. W1MO is thinking of getting married. W1ATM and W1CPV are going strong. W1AOP works nights. W1FBS is on lots. W1FAH is QRL. W1AAD and W1AMD are on after long absence. W1BGA, our RM, sends a lengthy report. W1BOY is bothered by YLs. W1DFB joined the Army. W1BIW is having BCL trouble. W1BTP is on 3.5 mc. W1ASZ has five schedules. W1DCR reports he is the best chiseler in Pawtucket. W1ELU is getting out well. W1AFW stepped up his modulation percentage. The new Pawtucket Radio Club meets at the studio-lab of W1AFW with W1ABO, Pres.; W1BIW, Vice-Pres., and W1ALI, Sec. W1TZ has a good c.c. signal. W1DW gets good DX. W1AGB has a Cape Cod schedule. W1BOS opened up for the winter. Don't forget to send in your reports.

Traffic: **W1**ASZ 28 FBS 22 BOS 14 AOP 7 BGA 7 AWE 5 DCR 5 AFW 2 CGO 2 BUX 1.

NORTHWESTERN DIVISION

IDAHO — SCM, C. R. Thrapp, W7AYH-W7CKO — W7UQ, U. of Idaho, is on full blast; W7ABB is the op in charge. W7CAP schedules W7BVE. W7AAJ is QRL B.C. station. W7BRD reports lots of activity around Pocatello. W7AFH and W7ACP are having receiver trouble. W7BOM is building new c.c. rig. W7QD is QRL school. W7BHN is on 1.75-mc. 'phone. W7BKA finished rebuilding. W7BRU is off the air until Christmas. W7AKZ lost some tubes. W7ATN is rebuilding. W7DD reports DX work. W7BRY has been having FB rag-chews with the BCLs. Hi. W7BAR is building 56-mc. rigs.

Traffic: **W7**UQ 71 BRD 47 ALY 20 ATN 16 AYH 10 AKZ 8 DD 3 BRY 1.

MONTANA — SCM, O. W. Viers, W7AAT-7QT — W7ASQ is c.c. on 3575 and 7150 kc. W7FL reports W7AFY, W7CBY and W7BNL active in Bozeman. W7AMA's house burned down. W7AHF moved to Kalispell. The second operator of W7AHF is still at Somers. W7CEG is active in Somers. W7AFS received heard report from Russia. W7BGC will be on with his portable W7BDM. W7BHB schedules W7HS and W9FMP. W7COX is the call of the SCM's wife. W7AOD has 380 watts input to his final stage. W7BVI works the east coast on 3½ mc. W7BYR was in the S.S. W7BCE is our newest ORS. W7BMX returned to Great Falls. W7AUB is new station at Portage. W7BDJ has increased power. W7BVE says Montana quartz is the "nertz." W7BQG says W7FL and W7BAY of Bozeman visited the Great Falls gang. W7AVL wants to swap a '60 for a '52. W7BOZ is putting in c.c. W7BSU can't get out well on 7 mc. W7BKM worked ZL3CC and ZL3CS. W7BOZ has a new sky hook. W7BHB rebuilt his c.c. rig. W7BNU is an old Morse op. W7COY at Cascade, also W9BFC and W9FKI of Minnesota, just arrived and says he will be on soon. Address: W7COY, C. W. Ofelt, Cascade. W7AAT used 3½ and 7 mc. for the S.S. Contest. Keep the reports coming in, fellows.

Traffic: **W7**AAT 289 FL 46 BHB 24 AOD 32 BYR 32 BCE 251 BVE 53 AVL 51 BOZ 9 BSU 20 BKM 5 ASQ 68 BDJ 4.

OREGON — SCM, Ray Cummins, W7ABZ — W7AWH again makes the BPL. W7DP reports a goose dinner at W7PL's. Those enjoying the culinary skill of Mrs. W7PL were: W7AIP, W7BDN, W7KR, W7MQ, W7BZS, W7DP and W7BIX, all of the Pendleton Radio Club. W7AHZ lectured the Eugene Club on reporting, and woke up W7AIN, W7PI, and W7OZ. W7CFM reports that the Eugene Club had a fine talk on impedance matching by W7QW. W7BMR worked CE7AA. W7AMF has three schedules. W7AQY has p.p. '45s. W7BLN notifies the SCM that the All-Oregon Convention will be held in Marshfield, April 9 and 10, 1933. W7AEJ is QSPing from a patient in the Coquille Hospital to his folks in Modesto, Calif. W7BWD now has a.c. in his shack. W7BUF uses snowshoes to climb

over the antenna-clippings in his back yard. W7AZW is Navy op at NPF. W7ATC is c.c. W7CCU wants pictures of his American Legion station. W7AMR hopes to hook some traffic. W7BMA, W7BOO and W7AYV, of Astoria, visited the SCM. W7AHJ is looking for traffic with tears in her eyes. W7AJX is re-papering the shack. W7CCI has a single '45. W7ASK worked a W8 in W. Virginia with 275 volts on a '26. W7CBD and W7ARZ are attending OIT. W7HD is new ORS. W7ED delivered 11 from K7FF. W7PE reports. W7WR says skip is tough. W7APE is QRL Weather Bureau. W7WL handles important eastern traffic. W7AEM reports the following 1.75-mc. 'phones in Oregon: W7BZO, W7MF, W7AVV, W7CCI. W7BLR wants a job. W7ALA did an FB job on the Amplifier. W7AIG wants to be an ORS. W7BOH worked a "J" and XU1U. W7SY is quite a rag-chewer. W7CBA keeps plugging along. W7AXJ has plenty of schedules. W7ALM was active in S.S. W7BKL is going 1.75-mc. 'phone. W7AXO worked England and Belgium. W7AWI is QRL post-office. W7BTH got some filter. W7PK says all the YLs want to marry him. W7AJM reports that the junior op, age 2½ yrs., has to be locked out of the shack. W7BPA and W7BTF are both c.c. W7APF has FB signal. W7BXU is back from Forest Service. W7BYC has phosphor bronze antenna. W7BTS is rebuilding. W7AMQ is moving. W7ABZ finds that neighbor's super-het makes an FB monitor. The Rose City Amateur Radio Club is now installed in their new club rooms, Room 615, Imperial Hotel, Broadway and Washington Sts., Portland.

Traffic: **W7**AWH 582 ACH 270 AXJ 168 AYV 98 WR 69 BMR 75 HD 57 AMF 56 AHJ 46 AQY 44 AIG 34 BOO 31 APE 25 SY 20 BTH 15 PE 15 BMA 15 WL 15 ED 14 BLR 12 ABZ 12 AXO 11 BPE 9 BOH 9 BZS 7 AJX 6 CBA 5 ALM 5 ATC 4 BPA 3 AMR 3 AEM 2 ALA 2 ZZZ 2 COU 4 BLN 1 BKL 1.

ALASKA — SCM, Richard J. Fox, K7PQ — This report received by radio at W7BGH and mailed to HQ. K7ANQ returned from a six weeks trip. K7ALT returned from vacation in Seattle. K7PQ is on with new c.c. outfit. K7TF has a hard time on account of QRM to BCL. K7BND is using a portable rig to maintain communication with his trapping cabin. K7BNW is handling traffic in great style. K7BMY reports receiving conditions rotten at his shack. K7AUM got back on the air after a month's trip to Pacific side of the Aleutian Islands. VE5DX was a visitor at K7PQ. K7BQE's license expired on him. K7VH is held up pending license modification. K7BAQ is new ham at Skagway and turns in a nice total. K7BZX has installed a commercial transmitter on his boat. K7BWQ can't keep schedules account of unfavorable working hours.

Traffic: **K7**TF 7 BNW 19 BMY 34 ARL 42 PQ 117 BND 132 FF 307.

WASHINGTON — SCM, John P. Gruble, W7RT — Congratulations to W7NR for making BPL and leading Section. W7NR was active in S.S. W7OV schedules K7FF, K7HA, and W7AWH. W7TZ tried grinding a crystal. Lack of space is antenna problem for W7AFC. W7BNI will use tourmaline crystal on 14 and 7 mc. W7AVM completed a new shop at Aberdeen. W7SL will use W7AG when new receiver is ready. W7ASW is c.c. on 7162 kc. Illness kept W7CHH off the air. W7WY is A.A.R.S. W7HS relayed a message from East Coast to California, with result that the message, originating in Spain, reached its California destination in less than forty minutes! W7ADR should be on air by now. W7BCC turns in a nice total. Most of W7APS' traffic was originated. W7AHQ is using c.c. portable, W7CNW. W7CKH is active at Anacortes. W7BTZ prints QSLs. W7CPE is new at Aberdeen. W7CCF is interested in ORS. W7DK, Radio Club of Tacoma, is to operate on 1.7 mc. W7BB scheduled W1SZ and K7UT. W7AQB is most active Grays Harbor station. W7AAZ submits news on Vancouver Club. W7OM can operate on all bands. W7BFR has trouble with R.F. W7LD and W7ABU use c.c. oscillators. W7WG is heard with c.c. W7CQG and W7CPP are new operators at Vancouver. W7AZI enjoyed the "ham" programs over KXA. W7JD announces at KPCB. W7BHP had trouble raising Seattle for QSP. W7APR took part in ORS and S.S. Contests. W7BID is attending U. of W. Louis Huber, former SCM of Iowa and A.R.R.L. Director, is using portable W7UU at Seattle. Mr. and Mrs. Wallace keep W7MM going. A new 300-watt rig at W7AYO, RM. W7IG reports health improving. W7AFP has antenna tied to a church steeple. Did we hear a "kick" from W7BYF on the SCM's reports? W7CGN is Seattle's DX man. W7US is active on 'phone. W7AWC blew a 50-watter. Norman Cameron, better known as "W7SWL," is now W7CPK. W7BUK is located in the country a few miles from Bellingham. W7BHH clicked east coast on 3.5 mc. W7CE is Ex-8DFV of Ohio. W7BDW sticks to 14 mc. W7QI was forced to rob the BCL set for receiving tubes. Most of W7LD's traffic is S.S. W7BPV took traffic from VE4BZ. W7LM, Bellingham, got penalized for speeding. W7AIA is the Vancouver Amateur Radio Club station. W7CJS likes KXA broadcasts. W7AIT was busy with BCL sets. A new amateur radio club at Port Angeles is being started by W7BJH. W7CNZ, W7AXI, W7BPO, W7CLK, W7CMO, and W7BXF are working with new equipment. The Traffic Contest among the Spokane group shows W7HS and his team well ahead of W7APR. W7RL has an e.c. frequency meter. W7AAX hooked Africa on 7 mc. for WAC. W7BTV and W7KQ are Tacoma stations on 3.5 mc. Following report traffic handled from Spokane: W7CLD, W7CNC, W7AJI, W7BEV, W7CKR, and W7CIF. Tacoma stations on 1.7-mc. 'phone are W7BMG, W7ABU, W7AZI, W7ARN, and W7AVA. New man at Aberdeen is W7CPE. DX at W7CND is K7, W5, and W9. W7AXT is ORS applicant. W7KV broke his foot in basketball game. W7CCN is active at Almota. A three stage 50-watt transmitter at W7BCV! K7CKK is using W7CNS at Seattle. W7BWG, Ferndale, is member VCR. Seattle's YL operator, Miss Norma Jenner, is getting R8-R9 reports from California, using a '10 at W7BCB. W7BDK depends on portable equipment for communication when in mountains. W7BUW is to use c.c. with type '10s. The license of W7BKW expired. W7UO is using motor generator. W7ACS reports via W7TS. W7CCT and W7ADV are new Yakima VCR members. W7ATW is building. W7TX has been busy with Directorship race. W7AIU is to use 'phone soon. Following stations help Yakima's traffic activities: W7AUT, W7AYC, W7BUX, W7BYB, W7BUQ, W7BUW, W7CGZ and W7CMX. W7TS declares the S.S. FB. W7CGK relays traffic for Ellensburg reliably. W7KO is helping the gang stay on frequency. Listen for the SCM's program on amateur radio over station KXA, 760 kc., each Saturday afternoon at *four* p.m. W7FP is active at Renton with 3.5-mc. 'phone. Other active 'phones are W7VF, W7IA, W7SL, W7BZ, W7APT, and W7FN. The SCM wishes to thank you all for your splendid coöperation. Season's greetings, gang!

Traffic: **W7**NR 545 OV 265 IG 224 TS 162 HS 157 BHH 129 BCC 114 WY 109 LD 90 APS 83 AQB 69 AZA 59 BUW 52 CCF 43 UU 36 AYO-RT 34 TZ 33 BCV 29 AHQ 26 BYB-ACS-BNI 25 CGN 28 CCN-AYC 22 TX 21 KV 20 AZI-APR 19 BSX 18 CGK 15 SL-AIT-AF 14 CHH 12 BB 11 CMX-QI 10 GN 9 CND 8 BTZ 7 CJS-BUQ 6 AQJ-AJI 5 CLD 4 CKR-AIA-CLK-KO 3 AVM-BHP-BPV-CMO-BEV-BUX-CGZ 2 CIF-JD-CNC-AUT 1.

PACIFIC DIVISION

NEVADA — SCM, Keston L. Ramsey, W6EAD — W6AJP is high man again. W6UO has a second op now, Charles B. Newcombe, Jr., who just got his ticket. W6FMS is now an ORS. The University of Nevada W6YAR had a station in operation on Homecoming Day. W6AAX reports traffic. W6FUO is rebuilding receiver. W6EAD is building a 56-mc. receiver. W6CRF lost all his licenses in moving. W6BYR is QRL school. W6ZO is going back on air. W6ATN is heard occasionally. W6AFR is working good DX. W6FME is on with a '52. W6EEF has a new transmitter.

Traffic: **W6**AJP 310 UO 141 FMS 84 AAX 75 FUO 32 EAD 14 YAR 128.

HAWAII — SCM, C. D. Slaten, K6COG — K6EWQ is Hawaii's new Route Manager. K6AIU has a Hartley rig with a '52. K6COG has an additional call now, K6AQN. K6GQF, COG's brother-in-law, is on the air with P.P. '52s. K6FAB is temporarily off the air. K6ARB has a new call, K6GBY. K6CRT has been on sea duty. K6AJA has a brand-new baby YL. K6EDH's brother recently got a call, K6ESE. The Hilo Club is meeting at K6AJA's home. The reorganized Oahu Amateur Radio Club has regularly been meeting on Sunday mornings for QSO parties. How about the Hilo Club joining in?

Traffic: **K6**EWQ 213 AIU 47 EDH 42 ACW 16 CRT 14 COG 6.

EAST BAY — SCM, S. C. Houston, W6ZM — Alameda County: CRM, J. H. MacLafferty, W6RJ. W6NAC leads the section this month. W6RJ says that Trunk "F" and RM work keep him plenty busy. W6ZM pounded out a few Dairy Show invitations while arranging for the show booth. W6GMX handled a few of the show messages. W6AF has a daily schedule with W6DDD at Salt Lake City. W6AAC reports for the first time. W6YJ, Tech High Radio Club, held open house on the night of Nov. 10th; ops were W6CBI – W6CJD – W6BJI. W6AQ was in operation at the Dairy Show, with W6CUG's portable MOPA. W6EGM-W6ZM-W6AKB-W6TT-W6ALH and W6AMN assisted at the show. W6DUB is looking for DX. W6YM sends in a good report. W6CDA is home from the hospital. W6DKJ and W6CSV report. W6HH, W6CZQ and W6NB are new reporters. W6CIZ is a new ORS. W6DHS sends in his first report in two years. W6CBF announces that he will send beginners code practice every Tuesday and Friday at 8:00 p.m. on 1939 kc. W6AHI (Ex-W7KG) is on the air with c.c. W6CDP is building new receiver power supply. W6PB has been QRL work. Contra Costa County: W6EJA discovered that 3.5 mc. is FB for traffic. W6AAT says every little bit helps. Napa, Solano and Lake Counties: RM J. Claussen, W6AUT. W6CAN sends in a report. W6CIZ has been appointed ORS. The Hammond Memorial Bug was presented to W6CDA at the last Hamfest. A new contest is on from Oct. 15th to Apr. 15th to see who will get it for the next six months. Send in reports not later than the 16th.

Traffic: **W6**NAC 492 RJ 233 ZM 220 GMX 214 AF 134 AAC 114 YJ 98 NB 63 AQ 60 DUB 49 EJA 37 YM 24 CDA 11 DKJ 10 CAN 9 CSV 5 HH 4 CIZ 4 CZQ 3 DHS 3 AAT 1.

SANTA CLARA VALLEY — SCM, Bruce Stone, W6AMM — To my knowledge, this is the best report ever received in the SCV Section. Congratulations on a wonderful report! W6FQY turned in the highest total — his first report, too! W6FBW ran him a close race. W6DBK is another new reporter with a fine total. W6HM, with a fine Trans-Pacific total, is the only one to make the BPL. W6YG has a daily schedule with W6FOO. W6AMM's total seems to have suffered this month. W6ENF has a good total in spite of college work. W6BMW reports QRM hindering K6 traffic. W6YL carries three schedules. W6DBB sent the results of the St. Marys vs. U.C.L.A. football game to K7UT while the game was in progress. W6CEO is continuing P. I. schedule. W6DSZ finished the seventh round with his frequency doubler. W6DSE has new a.c. receiver. W6QR spent the month rebuilding. W6BRW is hard at it in Medical School. W6CDX is using flea power. W6FMT worked her first VK. W6DBQ is very busy in school. W6FPL and W6GFW are temporarily off the air. W6CGL is tickled with the results of a PP rig. W6BSJ is back on with a new crystal. W6CTM is on 14 and 7 mc. W6UC has been heard at YL2JB. W6EBQ is putting his efforts into college work.

Traffic: **W6**FQY 346 FBW 321 DBK 226 HM 191 YG 135 AMM 121 ENF 101 BMW 74 YL 70 DBB 66 CEO 58 DSZ 46 DSE 41 QR 20 BRO 15 CDX 14 FMT 11 DHV 8 DBQ 4.

PHILIPPINES — Acting SCM, Newton E. Thompson, KA1XA — This report received by radio at W6HM and mailed to HQs. Pi hams meet on Nov. 29th for final information of Philippines Amateur Radio Club. DX with European stations is FB now on 14 mc.

Traffic: **KA1**HR 1173 1LY 842 1NA 278 1LG 275 1CO 180 1JR 80 1TS 76 4HW 57 9WX 50 1UP 33 1XA 27 1MC 24 1CM 16 1DP 8.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — More stations reporting this month than ever before in history of this Section. W6BMC, new ORS, Ex-SCM New Mexico, leads the Section. W6CNB has a new metal rack and panel job. W6FWJ says schedules FB. W6AXV is back in port. W6GNT expects to become an ORS. W6CTP hit the S.S. hard. W6EOP, southern terminus of Trunk Line "F," reports test message sent and answer received from the northern terminus, VE5HP, in ten minutes! W6BAM reports two new hams in Santa Ana, W6FCT and W6GSC. W6EPW is keeping schedule with Hawaii. W6AXN and W6AKY are rebuilding. W6BCF is installing new c.c. rig. W6EFK is Ex-W5TV. W6CNQ worked Japan. W6BGL is looking for traffic and schedules. W6BKZ has a new 'phone. W6BOW changed to 3.5 mc. W6CNK is getting ready for winter traffic. W6AYK says the new MOPA is FB. W6ACJ was off the air all month. W6FQU is having receiver trouble. W6QA reports a FB meeting of the Imperial Valley Radio Club. Let's have a report from every ham in this Section — and remember traffic.

Traffic: **W6**BMC 292 DQN 151 CNB 96 FWJ 59 AXV 42 GNT 37 CTP 35 EOP 30 BAM 24 EPW 15 AXN 14 BCF 13 EFK 12 CNQ 8 BGL 5 BKZ 5 BOW 4 AKY 2 CNK 2 AYK 1.

SAN FRANCISCO — SCM, C. Bane, W6WB — Byron Goodman, W6CAL, Acting SCM. Things are picking up nicely. W6PQ tops them all! W6BGW's schedule with W4OI provides an outlet for European traffic. W6CIS, our TL station, handled plenty of messages. W6NK sends out a plea for more ops! Our YL op, W6GLL, is having a new c.c. rig built for her by W6AYT. W6AZK will land near the top in the Sweepstakes. W6BVL schedules W7WY and W6ETJ. The 3.5-mc. band finds W6EYY working DX. W6DHQ still signs his portable call, W6AMM; he schedules his brother, W6DHS. A new '52 in the final at W6FPU. W6WU worked N. Y. and VP2 to bring his total to 24 countries. We welcome three new ORS, W6WU, W6FPU, and W6AZK. W6FPU is also OBS, now that W6BNA has his rig down. A new receiver brings in the DX for W6GKO. W6WC schedules W5ES. W6DZZ took time out from working Africans to put up a new 48-footer. W6MV is coming on with high power. A new MOPA at W6ABB. W6AVX operated at W6ZZD during the Sweepstakes. The super-het at W6CBN works FB. W6GMD is putting in c.c. An auto radio limits W6DNQ's time on the air. W6DXW gets on a little. A lot of rebuilding is going on at W6FCX, W6GKJ and W6DJI. Two fifties in PP hooked an African for W6AHH. Business has W6WB snowed under. By the time this is published W6ERK will be batting 'em out in his good old style. W6CAL schedules W3BUY to enable two brothers to r.c. for a couple of hours. Thanks for the reports, gang. Keep the habit.

Traffic: **W6**PQ 1400 BGW 377 CIS 222 CAL 143 NK 142 AYT 117 AZK 109 BVL 83 EYY 54 AAM 47 FPU 29 WU 21 GKO 14 WC 13 DZZ 12 MV 10 ABB 6 AVX 6 CBN 5 GMD 5 DNQ 4 DXW 3.

ARIZONA — SCM, Ernest Mendoza, W6BJF-W6QC — The Arizona Short Wave Club is still meeting on the first and third Wednesdays of each month. Everyone interested in short wave radio is cordially invited to attend. W6CDU has a pair of 75-watters. W6FZQ participated in the "Sweepstakes." W6BLP was off due to injured hand. W6CEC is considering junking his final P.P. amplifier in favor of a single ender. W6CQF is listening for Europe. W6CVW and W6GTV are rebuilding for high power. W6GJC is the proud father of a second "YL" op! W6BRI has a schedule with W6CQF. W6DOW is enjoying 3.5 mc. W6FGO gets a lot of good code practice from A.A.R.S. W6GBN is an S.P. Morse man. W6CLL is raising his fourth antenna. W6BVN reached Mexico City on her little heap. W8CHZ visited a few hams on his way to Los Angeles. W6DPS is working in New Mexico. W6FLG is operating at the Tempe Armory. W6FKX traded his model "T" for a "Chevvie coop." W6EBP bought a dandy set analizer from W6FKX. W6GGW is new ham in Phoenix. W6BJF sold his 800-volt transformer to W6FLG, and bought a larger pole "pot" from W6BYD. W6GFK is beginning to reach the east coast. W6CEW is up north near Pine and Payson, homesteading. W6EKU is on 1.75-mc. 'phone. W6CKF contemplates pushing one of his '52s with the other. W6GGS is finally on the air. W6DCQ is on 3.9-mc. 'phone. W6DSQ is attempting an all-electric monitor. W6FAI replaced his '10 final with a '50. W6FOH works duplex 'phone with W6FAI. W6DJH is QRL Police Radio. W6GZ will be an operator at KGZJ. W6BFA worked OA. W6AWD has moved to the cellar. W6DKU is out in the country. W6EGI returned from Los Angeles with a radiotelephone first. W6CGL is rebuilding receiver. W6FWD is on occasionally. W6ACN has antenna problems. W6CDY is busy at KUMA. W6FIP is trying to get on 3500 kc. W6DVJ hams between service jobs. W6FEA has a 60-foot high Zepp. W6GFS is a Morse man. W6ZZBZ (5ZZB) is back in Phoenix. W6EFC blew his plate trans-

former. W6COI expects to attend technical school in Texas. W6DRX has moved to a better location. W6AAM is very blue lately 'cause the R.I. told him he had waited too long before renewal of his prized call, held since 1921.

Traffic: W6CDU 689 FZQ 89 BLP 51 CEC 27 CQF 25 CVW 11 GJC 9 BRI 7 CLL 4 BVN 3 FAI 2 DOW 5 FGO 5 GBN 5.

SAN JOAQUIN VALLEY — SCM, G. H. Lavender, W6DZN — CRM W6AOA. Greetings from your new SCM. Coöperation can put this Section where it belongs so be sure to send in your reports to the SCM not later than the 16th of each month. Let's go, fellows. W6BIL's portable, W6ZZAK, handled a Sweepstakes message from W3CAA. W6GTO will soon be heard on 7 mc. Other active stations in Tulare are: W6BIL, W6CJK, W6YBK, W6CCW, W6EUQ. W6EUQ and W6BIL are shooting for an ORS. W6CGM has portable W6ZZGM. W6AOA, W6CGM, W6GEG and W6DQV did fine work in the recent flood in the Tehachapi Pass. W6GEG is talking about putting in a 500-watt bottle. W6DQV is causing QRM at the airport. W6AGV has an FB MOPA. W6GKE reports an optimistic ham calling CQ So. Africa and Russia on 3.5 mc. W6FYM was the only reporter from Turlock. W6EPQ reports QSO Africa and China. W6AME is active in U.S.N.R. W6BJE is handling traffic schedules. W6FFU has new electron-coupled frequency meter. W6BIP is now RM for Fresno. W6BUZ is on U.S.N.R. drills. W6CYY has increased power. Lodi is on the map with W6AV, W6FLS and W6CUL. W6DVI is having filter trouble. W6FRH is throwing rubber stamp messages in the wastebasket. Better to refuse them, OM. W6SF is pounding away on 7 mc. W6AOZ and W6BFH joined the U.S.N.R. W6GJO has new c.c. job. W6EXH ran up a swell traffic total. W6GQZ is after traffic. W6BXB reported for first time. W6DXL is waiting for the FRC to send his ticket back. W6BBC is wrecking crystals. W6DZN is experimenting with 56 mc. W6BCR is on 3.9-mc. 'phone.

Traffic: W6BIP 293 EXH 196 AOA 110 DZN 73 AME 68 FFU 56 BFH 49 AOZ 45 BUZ 43 EPQ 34 SF 32 FRH 32 CGM 31 BJE 27 AGV 18 GKE 17 GQZ 14 CYY 15 DXG 11 FYM 6 GJO 6 BXB 5 ZZAK 2.

LOS ANGELES — SCM, Hal E. Nahmens, W6HT — Twenty-three brand-new reporters! W6VR, W6GLZ, W6GNM, W6BZX, W6FZP, W6EIW, W6BXL, W6FXL, W6GEX, W6CGE, W6BXV, W6FXI, W6FMR, W6GRS, W6EMP, W6DOP, W6GKZ, W6ERU, W6DGH, W6ZZAR, W6ASD, W6AWJ and W6DSJ. Los Angeles County: W6NF-W6CFN leads the entire Section. W6BPU second high man, with W6EBK close on his heels. W6ETL makes BPL delivering Transpacific traffic. W6CVF has daily schedule with KA1HR. W6YBB has flock of schedules. W6EDW installed '11 p.p. final. W6DEP scheduled TI5FI. W6CXW was QRL Sweepstakes. W6DBC used temporary rig of '10s in p.p. during rebuilding. W6ACL is rootin' for those "200 reporters." W6DKM reports via radio. Any live hams not in Army Amateur Net QSO W6AKW. W6GOJ is new ham on desert near Lancaster. W6BZX is bothered with power leak. W6HG received QSL from ZS5U. W6EGJ schedules W6PQ. W6CZZ claims he voted for Roosevelt. W6CVZ is playing around on 1.75-mc. 'phone. W6EQW completed his a.c. c.c. frequency meter. W6EXQ has school QRM. W6DH has separate MOPA rigs on 3.5 and 1.75 mc. W6EKZ is on 14 mc. W6EII has new Comet Pro. W6FGT is new ORS. W6BLS is new OBS. W6FEX is working 14 hours per day. W6EGH worked PA0XF for his 70th country. W6AFU handled message from NX1XL, Greenland Expedition. W6EK is trying to master her new bug. W6TE is waiting for card from G5SY. W6BVZ is trying to work DX. W6BGF maintains local net schedules. W6CUU is building new house. W6DIO worked three new countries. W6CIX has new 70-foot stick. W6DTK gave message to W9AQL in Chicago to QSP Denver. W6BSV applied for ORS. W6ETJ has good total. New c.c. rig at W6ANN. W6EV was forced to QRT due to local power thumps. Most of traffic at W6LM is handled on portable rig. W6VR works his folks in N.Y.C. through W2ABT and W2VH. The depression hit the rig at W6CGP. W6ZZA is experimenting with different hotels in San Francisco. All SS traffic at W6AIX. W6CPJ has shifted to 3.5 mc. W6EUV handled messages for the hams attending the U.S.C.-California game. Traffic picking up at W6AIF. W6DWP expects to be back on regularly. W6DZI made 711 points in ORS Party. W6VB made WAC. New mast at W6EYI. The '52 at W6EEP went west. W6AHP is building 1KW outfit. W6FWN is installing crystal. It is rumored that W6FVV has a new '11. W6GNM is building MOPA 'phone. W6FKF is rebuilding. W6COF has changed QRA. W6DEL finds his shack better DX location than house. W6AEO installed '52 in final. W6EIW craves interview with the varmints who removed every thing from his shack but the linoleum. Three ops keep the key hot at W6HT. W6BVC worked ZS2A to make WAC. All Naval Reserve traffic at W6GFG. W6FMK schedules W6YG. W6DQG is stepping out. QRN holds up production at W6FMH. W6CPX is working big DX. W6ON reports progress of Pasadena Short Wave Club. W6WO received ten European cards. W6BER is grinding crystal. W6EAK worked ZU5J the "long and short way" the same day. W6BFL reports a nice new junior op. Congrats! W6FJT is working on new c.c. rig. W6FZ is heard working plenty DX. W6NW hopes to handle traffic from San Nicolas Island with portable W6DRI. W6DSP reports following: W6DBD now located in Glendale; W6DRC back on air; W6AYF rebuilding; W6AQW will be on air soon. W6AM worked 10 countries on 7 mc. morning of Nov. 13th. W6MA says plate supply now working great. W6AGF has bad power leak. W6TN is rebuilding. W6GEX is new reporter. W6FEW says W6FJS builds FB receivers. W6DFO can't get big rig to perk, so is on 14 mc. with pair '45s, which pleases W6RZ. W6DLN is building new receiver. W6CGE sends code practice every Monday from 6:30 to 7:30 p.m. on 3530 kc. W6FXR worked ZL. W6FUF worked hard in S.S. W6CUH designed one of his famous 1 KW '52 jobs for W6BDD. W6BXV put in ¼ KW on 7 mc. W6FGQ is back on air in L.A. with the famous W6USA Comet "pro" for a receiver. W6FMR reports over the air. School QRM at W6CEU. W6GNZ is rebuilding. W6CEM blew his crystal. W6EMJ is building 56-mc. outfit. W6BJX finally reports a message. W6GRS is a new ham in Alhambra. W6EYJ is planning on 14-mc. 'phone. W6DOP needs an African contact for WAC. W6DZR is installing rig a-la W6CUH. Code lessons from W6CTT on 1.75 mc. have been changed to Thursday at 7:00 p.m. W6EMP is constructing '52 c.c. job. W6BSW's call has been changed to W6BOB. W6LY is spending his time on 56 mc. The new officers of the Associated Radio Amateurs of Long Beach are: Art Herrald, Pres.; W6DZK, Vice-Pres.; W6DJC, Sec.; and W6HT, Treas. Santa Barbara County: W6BZF is out in lead this month. W6EMY is new ORS. W6AWY reports W6GVS new ham. W6EZK is using portable W6ENP. Portable W6GDU gets out FB. W6LC uses separate rigs for 7 and 3.5 mc. W6ENJ uses '11E in final. W6GKB is new U.S.N.R. member. W6AOY's son, W6EGS, seems to be on 24 hours a day. W6CNO is still working DX. W6DBJ is rebuilding. W6DJS reports visit of the SBARC to the new Ventura Club. San Bernardino County: W6FTV is in lead this month. W6CVV handled message containing astronomical data to South Africa. W6EAR is rebuilding. W6FNG schedules W6YBB. W6DZC is in line for ORS. W6GKZ is new reporter. W6ERM was visited by his brother, W7BBY. W6FYT now has 1KW input. W6DGL is QRL S.B.V.J.C. Power leak at W6FEC. W6FHR and W6DGH claim they are the closest hams in the 6th district, their rigs being 80 feet apart. W6GM is doing excellent work as O.O. W1BIK is building portable rig. Ventura County: W6ERU makes first report. W6FET wrecked his shoulder when his car turned over. W6GWJ, old Navy op, and W6GRL are new hams in Ventura. W6BDZ is back on for first time since spark days. W6CVK is having trouble getting transmitter to perk. W6BHO says 1.75-mc. 'phone FB. W6DTY is building a.c. receiver. W6DCJ reports from Santa Paula. San Luis Obispo County: Outfit at W6ALQ entirely rebuilt. W6FNP is experimenting. W6DWW is QRL. Riverside County: New single signal receiver at W6EFY. W6DLV built up "unorthodox" receiver per January *QST*. If you want a copy of the Section paper, *The Dope Sheet*, report your traffic to the SCM on the 16th, even if only ONE message!

Traffic: W6CFN 391 BPU 344 ZZAR 312 BZF 293 EBK 276 ETL 257 CVF 229 AFO 225 YBB 212 EDW 194 DEP 163 CXW 131 DBC 121 ACL 117 FTV 114 DKM 97 AKW-BZX 95 HG 87 EMY 85 EGJ 82 AWY 77 CZZ 76 CVZ 74 EXQ 73 EQW 65 DH 63 ALD 61 EKZ 60 CTD 58 EII 57

DLJ 55 EDZ 53 FGT 52 BLS 51 FEX 50 BVD 48 EGH 47 DJS-AFU 46 CVV 45 EK 42 EAR-BGN-TE-BVZ 40 FMK 38 BYF 35 BGF 32 CUU 31 FNG 30 DIO 29 FUF 28 CIX-DTX 26 BSV 28 ASD-FZP 26 ETJ 25 ANN-EOG 24 EV 23 AOR-LM 22 AAN-VR 21 DZC-ADP 20 CGP-BIF-ZZA 19 AIX-CPJ 18 EUV-AIF-CZT 17 BFM-BCT 16 DWP-DZI-FYA 15 FLC-VB-DQZ 14 AHP-GLZ 13 DTN-FWN-GNM 12 EZK-FKF-COF-DEL-AEO 11 ARY-EIW-HT-GFG-GKZ-BVC-EVL-AUB 10 DJC-FMK 9 DYQ-AWJ-ALQ-DQG-FMH 8 FZ-FYT-ERM-CNH-ON 7 WO-FMI-EJZ-GLA-BER-EAK-BXL 6 BFL-EFY-DGL-FJT-NW-DSP-FXL 5 EYZ-FNP-FEC-CFI-ERU-DSJ-AM-MA 4 AAE-DZK-AGF-GDU-BME-TN-ERC-ESA-ETX-GEX 3 FEW-RZ-DLN-LC-ENJ-FDE-CGE-FXR-ELU-CUH-ELV-FAV-BXV 2 FGQ-FET-FXI-FMR-CEU-GNZ-ENV-EMJ-BJX-GEU 1 GAL 18 CEM 4 BPP 1.

SACRAMENTO VALLEY — Acting SCM, George L. Woodington, W6DVE — W6AHN, one of our exSCMs, is back on the air. Mr. Noonan of the Boeing Air Transports Lines gave a 56-mc. demonstration at the Sacramento Club. W6GAC gets out well with an '01A with 180 volts. W6UM blew a filter condenser. W6FRP has some FB schedules. Acting SCM W6DVE, 3660 kc. 716 Redwood Ave., North Sacramento, will be very pleased to receive your traffic and news reports. Let's get on the map and make it a bigger and better Section.

Traffic: **W6**UM 5 FRP 3 DVE 20 GAC 21.

ROANOKE DIVISION

WEST VIRGINIA — SCM, C. S. Hoffmann, Jr., W8HD — W8ADI has been appointed Ensign in U.S.N.R. W8EIK is NCS for 3rd Section, VCR, U.S.N.R. A.A.R.S. calls for W8OK and W8HD have been changed to WLHA and WLHB respectively, and are licensed for 3497.5 and 6990 kcs. operation. W8GTD visited Wheeling hams. W8CDV, W8ELO and W8BOW are QRL with school work. W8BTV was home for Thanskgiving. W8ASI and W8CSF are rebuilding. W8AZD got R9 from VK5HG. W8DPO had illness. New stations reported: Wheeling, W8HWO and W8HWT; Moundsville, W8HVY. W8GB was moving. ORS applications have been sent to W8DFC and W8CHM. W8GOQ has new c.c. set. W8ELJ blew his rectifier tubes. W8CDE is putting in 50-watt 'phone. W8BDD hopes to have new c.c. set on by Dec. 15th. W8FQB, W8HSA and W8HD worked a lot of 6's. W8GBF got sick at a Hamfest! W8FKR schedules W3CDG. W8FQA may be heard from W8ASI. W8TI made a high score in the Sweepstakes. W8CVX schedules W3BOE. W8IB is going up to 3.5 mc. New ORS: W8EIK and W8BTV-W8ZZCO.

Traffic: **W8**EIK 214 TI 210 OK 64 BOW 52 HD 45 HSA 37 ELO 24 IB 22 AZD 21 CVX 20 DPO 18 ELJ 16 DJD 13 GOQ 10 CDV 9 CSF 8 ASI 6 FQB 6 FKR 5 BKG 3 CDE 3 DFC 3 Call Missing 89.

VIRGINIA — SCM, R. N. Eubank, W3AAJ — Following have been appointed Route Managers: W3FJ, W3CAH, W3BGS, W3BRY, W3BJX, W3NT-3NB, W3BDZ, W3AGW. Congrats to you all! W3NB leads in traffic; W3FJ is second. W3CLH is c.c. on 3595 kc. W3BFS is building P.P. '47 Amp. W3FE is QRL school. W3BRQ is operating at W3NB. W3GY schedules W7FP. W3COJ schedules Danville. W3BAI has low power 1.75-mc. 'phone. W3BPA is using c.c. 3605 '47 kc. W3CXM schedules W1MK. W3AUG is back in traffic stride. W3CHE is now at 1431 Mallory Ct., Norfolk. W3AKN is rebuilding meters. W3CLD is QRL college. W3EJ has discontinued due to transfer. W3ACN is rebuilding. W3AAF is ORS. W3CMJ says club going with 14 members. W3CKM schedules Roanoke, Norton, Clarksville and Ferrum. W3BAD schedules Roanoke and Blacksburg. W3CKM-W3BAD handled message to President Hoover. W3CLX reports lots DX. W3MQ, our R.I., reports traffic. W3BZ has schedule with W3CA. Following cities have clubs, that report information: Richmond, Hopewell, Blacksburg (NEW), Staunton, Danville, Petersburg, Charlottesville, Lynchburg, Roanoke, Bluefield (Va.-W. Va.). W3TJ is still in Richmond. W3AAJ handled Navy Day message to Mayor. W3CHR is ragchewing. W3BFQ is c.c. 3550 kc. and 7004 kc. W3GE is building c.c. rig. E7BLI, W7AAT and Morris Harwood (ex-3CBQ) have formed a "Last Man Club." W3CSI is new call in Clifton Forge. W3HV is new call in Phoebus. B. L. Stewart is joining U.S.N.R. to command Roanoke Unit. W3BSB reports DX FB due to S.S. Contest. W3BZE got a kick out of S.S. Contest. W3BAI had 5-hour QSO on 'phone with W3CAH. W3BAN worked W6AM. W3CMT is new call in Falls Church. Richmond Club held Treasure Hunt. W3BUO is operating at W3NB. W3AII is on air at V.M.I. Lexington. W3BWA worked CT1BG. W3CFL liked ORS Contest. W3ATY is on air again. W3CRQ is being used by 3ASK. W3BMN is rebuilding. W3BYA is now ORS. W3AHQ is on regularly. W3AMB is back with us. W3BHC resumed activity. W3BTM is on 3520 kc., 1–5 p.m., daily. W3AIJ is an OT back with c.c. W3COO is plenty fast op. W3APU reports regularly. W3WM is working lots DX. W3BUR is joining Trunk Line. W3NO has S.S. Super. W3BNH has new high-power rig. W3AEW is back with c.c. W3ZU is crystal-minded. The following are new Va. stations: W3BOH, W3BXW, W3CKB, W3CIT, W3AGQ, W3BZA, W3AYR, W3CIJ, W3BEF, W3CIA. W3APT plans to rebuild. W3AZU worked Mexico. W3CPN-WW was visited by W9KD and W3AGH.

Traffic: **W3**NB 920 FJ 532 EJ 379 AAJ 273 CXM 183 BUR 136 CKM 112 BAI 109 BJX 86 ACN 77 CAH 68 BRY 57 BAD 32 BTM 30 AHQ 28 AUG 26 BPA 26 AKN 25 BGS 23 CMJ 23 AIJ 20 CFL 19 AAF 18 GY 18 BZE 16 AMB-BYA 12 CHE-GE 10 COO 12 COJ 9 BWA-MQ 8 CLX-AGW 7 BSB 20 ATY-WM 5 APU 4 BAN-CLD-BNH-AEW-NO-BLE 2 BHC 1 APT 72 AZU 11 BDP 43 BSM 8 ADJ 2 ZA 3 BKS 50 BXN 10 BGX 9 BIW-CNY 6 BDZ 4 BPI 1 AEI 17 AJA 4 CKK 3 WM 2 BBA 4 W1ZZAR 86. **W3**CLH 22 BXP 5.

NORTH CAROLINA — SCM, H. L. Caveness, W4DW — Activity in this Section is at a high level. The Hamfest in Winston Salem on Nov. 6th was a huge success. We announce the following appointments: W4NC, ORS; W4MR, OBS; and W4TO, RM for Western N. C. W4NC, W4ZH, and W4JR make the BPL again! W4TO makes it on deliveries. The new club in Greensboro has been given a meeting place in the Y.M.C.A. building. The club in Charlotte maintains considerable interest. The hams of the Piedmont section of the state will be the guests of the Charlotte Club in December. W4AGF, W4ALT, and W4BHA joined the A.A.R.S. W4AVT got the hay-wire out of his rig. W4RE is busy with VCR. W4ZH is busy teaching night school. W4AGD is using two '10s in last stage. W4AEH aspires to be ORS. W4MR is on 14,340 kc. permanently. W4TO made an excellent record in the S.S. W4BQB, Ex-W4AKU, joined the Coast Guard. The airplane in which W4TJ has been training cracked up. W4AMC is building c.c. job for 3.5 mc. W4VN says a lot of good traffic is being moved on 14 mc. W4BJZ is on 3.5 mc. with c.c. W4PFA promises to be a real traffic outlet. W4OG catches a message once in a while. W4ANU, W4BOH, W4IF, W4AKC, and W4WX motored to Washington and came back with operator's licenses. W4IF also got unlimited 'phone license. W4EG is giving code practice two nights each week. W9APY, printers, donated to the State College Radio Club, W4ATC, a stack of fine QSL cards.

Traffic: **W4**ZH 522 NC 508 JR 474 DW 422 VN 381 TO 262 AVT 123 AGF 106 TP 107 PFA 79 MR 70 AOA 49 TJ 46 EG 38 AMC 36 ATC 27 AOE 23 ANU 22 AEH 15 AGD 12 JB 12 BJZ 11 OG 7 RE 5 OC 5 BHR 1.

ROCKY MOUNTAIN DIVISION

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ — Utah: W6EXL will soon have his c.c. outfit completed. W6AHD is NCS of Utah Fourth District A.A.R.S. W6DTB was heard in Russia. W6FRN is building an MOPA. W6AVW applied for portable. W6DFY is an old Morse man. W6GQC is a new station in S.L.C. Park City is represented by W6GQR. W6BTX forgot his traffic total this time. W6APM has gone back to the old TNT. The traffic schedules of W6DPJ produce results. Wyoming: W7ARK hears foreigners R9 on his Comet Pro. W7ARX, Buffalo, and W7CCC, Sheridan, are experimenting with 1.75-mc. 'phone. W3ZZF, portable, was in Sheridan and Big Horn with his 3.5-mc. c.w. W7ADF hooked VK and ZL with his '45s. W7NY, W7BXS and W7CHR are rebuilding. A.A.R.S. activity helps W7AMU's total. W7CJR and W7CBL worked some DX. Some one stole W7AKW's station and operator licenses.

Traffic: **W6**DPJ 1244 FAE 32 APM 21 **W7**AMU 19

W6FRN 17 W7ARK 12 W6DFY 9 AVW 6 W7BXS 5 ACQ 5 W6DTB 4 W7CJR 2.

COLORADO — Acting SCM, Artie Davis, W9BJN — W9ESA is on the air a great deal again. Our Director W9AAB has been about down again with a lame and sore back. W9BTO will be on soon with new outfit. W9CKO reports for Loveland and Boulder: W9IFD has a new portable, W9GQX. W9KKY is kicking out. W9JFD is active in U.S.N.R. W9CKO has the record for not completing QSOs. Visitors here were W9KCQ, W9FYL, W9JFQ. The Boulder Radio Club is active at the University. W9HIR has a class "B" phone. W9KRV is a new station. W9KRV is operated by W9JFQ and W9FZB. The call is FEI and used sometimes. Greeley: W9EDM is QRL college and KFKA. W9FQJ is relief operator. W9BOO, the Hamlet, is ready to go. W9FQK-W9HPR is on 3.5 mc. W9IGO moved to Willington. W9PO has a '10 on 7 mc. Geo. Hoke is waiting for his call; same for Earl Leonard. Woodman: W9JNV makes the BPL. FB! Colorado Springs: W9EYN assists KOA in a world-wide broadcast from Pike's Peak. W9EXV wins the highest honors in nation-wide Collegiate Intelligence contest. W9HDI is doing his regular rebuilding. W9IQS keeps 5 a.m. schedule. W9AMS is doing wonders with '45s. W9JAV lost his tag. W9DNP is QRL KVOR. W9JCQ has an '03A. W9EHC is c.c. on 3.5 mc. W9EYN and W9EHC work Duplex 'phone. W9JCQ is remote control. W9FXQ visited W9EHC. W9DYP is QRL KVOR. W9EPN failed to report so he got a fine of 10 cents tacked to his pocketbook. W9FGK is QRL work. The Pike's Peak Club has a new meeting place, City Hall, next to Police Station. X9DUI has the bug again. Doc Foster, Kuth O'Kee and Lee Simmons are awaiting the R.I. Leadville: W9GEG built a new receiver. Grand Junction: W9DQD had lots of fun in Sweepstakes. Ovid: W9JGF, W9ZZAR is going to be back in Denver soon. La Junta: W9CDE keeps A.A.R.S. schedules. W9GNK reported via radio. Canon City: W9FPZ is rebuilding. Englewood: W9FA, X9ENM, X2KG, is pushing 450 watts input. W9FQ came on air Oct. 28th, has worked all Districts, 42 Sections. W9IAV is building MOPA. Bill Bramwell passed his ops license exam. W9EJW is on 7 mc. W7BCL of Cheyenne, Wyo., paid the Dever hams a visit. W9ESX had an extended visit with W7NY of Casper. W9EMU has new 3.9-mc. 'phone built by W9CJJ. W9AUJ expects to be on 'phone soon. W9HGL is Prof. at North Denver High (W9HOO). W9FFH has new receiver. W9EBR will be on 1.75 mc. W9ATM is on some. W9ACV is kicking out FB. W9HOU has a telephone pole to support his ant. W9FYY and W9HRI are QRL school. W9FYK, W9BYC-W9FV, W9JFQ and Mr. Kessel, W9YL, are QRL college. W9FFU and W9JRV are heard some. W9RJ is on 3.5 mc. W9JB and W9ECY are QRL Radio Service work. W9QL-W9BCW are QRL KOA. W9EVC is QRL KFEL. W9DSB, W9HQT, Bill Groves and Melvin Collier are QRL KLZ. W9QZ is QRL KFXF. W9HPY has built new receiver. W9HFZ is QRL filling station. W9GUW is QRL Walgreen Drug Co. W9GBQ is QRL Grange. W9FUQ is building "10 to 100 meter" Vari coils. W9FHX is pushing a pair of '45s. W9FCK is using his portable W9KFJ. W9EKQ and W9EPC keep Littleton on the map. W9EAM has had a very bad leg for some time. W9HON has a 250-watter. W9CSR is QRL college. W9CWX is heard now and then. W9CNL and W9COC have been a.w.o.l. from air. W9BYY is c.c. on 7 mc. W9CBU is on some. W9BYK and W9BTO built some crystals. W9BVO is QRL music. W9BQO is QRL Phone Co. W9AQN is on 3.9-mc. 'phone. W9GUW is second op. W9CJQ is on 7 mc. W9CWX is pounding out. W9CVE says 7 mc. has been going dead in PM. W9BVZ has a dandy 80-ft. tower. W9CND-QA expects to have a pair of '52s in final. W9BXQ, Art Harrison, Joe Turre and W9APR are keeping Police Radio GKPX perking. The retiring Acting SCM will always be ready to serve ham radio where most needed. Let's get behind the new SCM and push Colorado ahead.

Traffic: W9ESA 261 FA 211 JNV 519 DQD 51 KFJ 14 GNK 108 EJW 23 CDE 5 JGF 34 IFD 96 CND 44 EHC 5 JCQ 3 EYN 10 BJN 15 FYY 30 CWA 15 EAM 14 CVE 12.

SOUTHEASTERN DIVISION

WESTERN FLORIDA — SCM, Eddie Collins, W4MS-W4ZZP. Route Manager, S. M. Douglas, W4ACB. The Florida R.I.'s office is now in Miami. Mrs. W4KB went through the exam with flying colors. W5ZZR is in our midst. W4ALJ-W4CV-W4ZZAE promises a c.c. portable. W4UW-W5NO is at WCOA. W4MS-W4ZZP took unlimited 'phone exam. W4ASV-W4ZZW moved his station downstairs. W4VR is rebuilding. W4AUW is on 14,000 kc. W4ML is selling out. W4AQY-W4PDS is in the movie business. W4AXP is pounding them out. W4AGS-W4PCK keeps up his good work. Ex-W4ADV is applying for W4MX's call. W4AWJ is active. W4AQA is getting all set. W4AUV has a new transmitter. W4BOW is quiet. W4BMJ worked all districts on 3500 kc. W4ACB let his portable expire. W4QR is busy with 'photo business. W4AUA is keeping the U.S.N.R. going. W4SC does likewise with the FNG net. W4ARV shows up for exams. W4ZZR in Annapolis keeps his schedule with the gang. W4BGA replaced his '45s with '10s. W4KB continues to knock them out. W4QU has moved to W4HQ's. W4ZZAO wants to work Minnesota. W4QK is rebuilding. W4HQ keeps the U.S.N.R. unit going. W5BCB visits Tallahassee regularly. W2ABC went up for Commercial ticket. W4BFD has two FB mass à la *QST*. W4ABK is having transmitter trouble. Let's see a bigger report next month, OMs.

Traffic: W4BGA 46 MS 37 KB 24 AXP 2 AQY 21 ACB 14.

ALABAMA — SCM, L. D. Elwell, W4KP-W4DD, W4BOE and W4BMF all have 56-mc. rigs. W4BAI is high traffic man. W4DS has a nice signal. W4APU likes the ORS Party. W4BCL is trying to raise his power. W4PDX is hoping to organize a state net of National Guard stations. W4ALA says the Sweepstakes Contest will swell his traffic total. W4APJ handled a death message. W4AJC met the RI at Birmingham. W4FL sends his first report. W4CX was busy the 15th with exams. W4ADL has a new shack. W4BCV took the commercial exam. W4AWM is QRL school. W4WO hopes to be on soon. W4AJP handled traffic to the Cocos Island Treasure Expedition's station, TI5FI. The Birmingham Radio Club placed a transmitter at the Southern Medical Convention under the call W4ZZB, portable of W4AJP, who was chief operator. W4DD was in charge of the arrangements. W4AG paid the SCM a visit. W4ANB is using '45s. W4ADJ is having a long wait for the fifty. W4GN changed from d.c. to a.c. on his receiver. W4AKX and W4AUP had bad luck at the exams. The Birmingham Radio Club had the famous Captain Rooke as visitor at a recent meeting. A movie reel of the Cocos Island Expedition was shown. The Captain says he is indebted to Amateur Radio, especially TI5FI and W1MK, who formed the only means of contact between him and home, finally to call him home during his wife's serious illness.

Traffic: W4BAI 87 APU 55 DS 48 DD 45 PDX 40 APJ 28 AJP 22 ALA 16 FL 15 AJC 10 BCV 7 CX 3 AWM 1.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS — SCM, Chas. W. Davis, W4PM — Thanks, fellows, for the fine showing. Don and his assistant at W4WZ are burning up the Section! W4UT makes a fine showing. W4ABS is pounding out a nice total. W4JD sends a nice one. W4SM is keeping along with the leaders. W4YC is on 7050 kc. daily, 11 to 12:30 C.S.T., for Atlanta traffic. W4BGE is on 3987.8-kc. 'phone. W4KU's FB 'phone is heard regularly. W4MO has new mast. CM2WW will be glad to QSP Cuba. CM2SV and CM2NA are the latest addition to the c.c. converts in Cuba. CM2JM is getting back on. CM2GR works VK regularly. CM2OP is youngest Cuban ham (15). CM2RC is the station of the Radio Club of Cuba. CM2WW and CM8AZ are the only regular traffic stations in Cuba. W4JL is going to move the receiver in by the fire. W4LL is pounding in R9. W4OL sends nice QSL. The Atlanta Club was royally entertained by W4SM at his palatial new home in College Park.

Traffic: W4WZ 1052 SM 266 UT 455 ABS 290 JD 216 AJI 26 ZD 18 BOJ 16 YC 12 DL 11 BAB 4 JL 14 MA 8 PM 114 BPD 35 VX 27 AAY 53 BAG 53. CM8AZ 22 2WW 13.

EASTERN FLORIDA — SCM, Ray Atkinson, W4NN — East. Florida is at last stepping out! Those making the "100 total club" this month are W4AWO, W4GS, W4NN, and W4BMN. In Nov. *QST* we went in the ten highest Sections class for first time. Let's do it again! RM W4ALP sends in reports for Tampa. W4AKJ is building 3.5-mc. c.c. job. W4BOT is rebuilding receiver. W4BNR is adding c.c.

W4AFU and W4AMQ are off the air. W4BDY and W4AMV are new hams. W4AZF's OW passed her exams. W4AJX is raising power. W4AII is sailing the high seas. W4BN has been transferred to Charleston. W4DU and W4ACZ are working DX. The Florida 'Phone Net is working 100%. The Knights of the Kilocycles still have their regular Sunday morning get-together on 3.9-mc. 'phone at 8:00 a.m. W4AZB has been confined to bed. W4VP schedules W4WZ. W4BDM likes traffic. W4GR is permanently off the air. W4AXR is at a new address. The Daytona Beach gang say, "We are going to help put East. Florida on the map." The Tampa gang says, "Let's start this New Year right by winning a banner." Lakeworth outfit says, "We see no reason why East. Florida should stay out in the cold." Jacksonville gang say, "A banner for East. Florida or bust." With that spirit to boost us along I am sure 1933 will bring us a banner sure!! W4BGG is shooting traffic along. W4BIN broke a leg. Sorry, OM. W4AGJ has a new call, W4NI. W4PQ has packed his drums and returned home. W4AVD sends a nice traffic report. W4TK is again active. W4WS kept the old 'phone busy. W4AFV is semi-active. W4ASG will operate at W4GS. W4ANY is trafficking. W4QE is working ON7MC. W4BNI is building a c.c. outfit. W4LS is a new 3.9-mc. 'phone. W4BJS has a new c.c. rig. W4ZU is traffic bound with W4DZ and W4AQY. The following stations from the Army 'Phone Net send in traffic totals: W4WS, W4ATG, W4MF, W4DU, W4ADB, W4PT, W4BAM, W4LS, W4CJ, W4ACZ, W4UH.

Traffic: W4AWO 327 BMN 146 GS 113 NN 100 BGG 80 VP 75 PQ 35 ZU 31 WS 27 AGB 25 ANY 23 AKJ 23 AVD 18 BNR 22 ALP 14 TK 13 AII 10 BIN 10 ATG 4 MF 4 DU 4 ADB 4 PT 4 BAM 4 LS 4 CJ 4 ACZ 4 UH 4 BOT 1 QE 1 BDM 10.

WEST GULF DIVISION

NEW MEXICO — SCM, Jerry Quinn, W5AUW — Albuquerque: W5AOP is QRL work. W5CPO will be on soon. W5ASR is going back on c.w. Ex-W5BPJ is awaiting station license. W5AAX is heard often. His YF does most of the operating. W5BNT has '45 in T.N.T. W5AOE is using a condenser mike. W5AUW's YF is getting on well with the code; W5ZZQ is being used. Clovis: W5BVC wants some traffic schedules. Santa Fe: W5CGJ is getting a new "Pro" receiver. W5AIC is busy with service work. W5CJP is getting out well. Las Cruces: W5AGP is on 3.9-mc. 'phone. Roswell: W5ZM and W5ZU are building a 1.75-mc. 'phone. W5ZU has a new call, W5ZZAP. Please report your traffic, OMs.

Traffic: W5AUW 484 ZZQ 246 BVC 50 BPJ 30 AAX 30 ZM 3 BNT 1 ZU 1.

OKLAHOMA — SCM, Emil Gisel, W5VQ — W5BOE has a nice total. W5BPM keeps a fine list of schedules. W5ANI works VK and ZL. W5CPI and W5BDV report for first time. W5CBY say traffic scarce on 14 mc. W5CEB has worked 7 countries. W5AUA took exam for first-class ticket. W5GF will be back soon. W5OJ has 56-mc. rig. W5BVR says lots of traffic. W5BDX is looking for schedules. W5BAR is in the A.A.R.S. W5AUG received a card from Poland. W5CEZ hoped for 100, but came slightly under. W5BKN is recovering from an operation. W5CCL is having receiver trouble. W5MF is coming on 3.5-mc. c.w. W5AEI has "depression" trouble. W5AKX has a job in Wichita, Kan. W5BGX is attempting to pass the exam for unlimited 'phone. W5AFT is going to school in Manhattan, Kan., and operates W9GME. W5BKK changed from Hartley to P.P. W5CBH is coming on 1.75-mc. 'phone. W5AHD finds a little time on the air after getting married. W5ATO grinds and cuts his own crystals. W5ABF was seriously hurt when he fell off a barn. W5AVK operates at W5TC. W5BQA is still minus a license. W5ABO has a high-powered outfit. W5BMU was recently swamped with visitors, W5ARX, W5ATO, W5AJO, W5PP, W5BMB, W5VQ, and W5BHD all arriving within a half hour. W5VQ now operates 'phone and c.w. W5GA has a fine 3.9-mc. 'phone. W5BCO was recently presented with a new junior op. W5BLW is QRL servicing BC sets. W5ANB has an efficient break-in arrangement on 'phone. W5PP-W5AJO is active on 1.75 mc.

Traffic: W5VQ 335 BOE 232 OJ 153 BDX 114 BVR 100 CEZ 82 BPM 75 BKK 56 BDV 33 CPI 29 CBY 11 ANI 9 CEB 6 AUA 5.

NORTHERN TEXAS — SCM, Roy L. Taylor, W5RJ — All honors go to W5FC at Dallas for the most traffic handled this month. W5BII runs a good second. W5ANU says the new receiver is the berries. W5NW says W5AVF should be back soon. W5BCW is converting his XYL into a ham. W5BKH reports W5BDT a new 'phone in Ballinger. W5AZC on 7 mc. wants Dallas bound traffic. W5CIJ says QRM bad. W5ARS is strutting his stuff. W5AJG is now in the A.A.R.S. W5IT is handling lots of traffic. W5CAV may be heading the list before long. W5BTW is planning on a 50-watt PP job. W5AHC applied for ORS. W5BBQ (W5WW) reports again. G. D. Hallmark of Mexia comes through with a nice report. W5BYF is hitting the brass. W5RH has c.c. now. W5BKJ reports for Ennis. W5CHJ has been busy at WFAA. W5AID is having receiver trouble. W5ATG is working 3.9-mc. 'phone. W5IA has 3 schedules. W5BXV reports the Cen-Tex Amateur Radio Club has been organized by the amateurs of Central Texas. W5AMK has new 7-mc. Zepp. W5AHZ is on 7 mc. W5LM is working 3.9-mc. 'phone. W5BEQ is trying 1.75-mc. 'phone. W5CKP has YL fever. W5BXV is using '10s in PP. W5BEO has his receiver working. W5LM built 56-mc. receiver for W5CKP. W5AMW is waiting for the lacquer to dry on his dynamic mike coil.

Traffic: W5FC 641 BII 293 ANU 190 NW 100 BKH 99 AZC 91 CIJ 109 ARS 123 AJG 100 IT 136 CAV 80 AHC 41 BBQ 53 G. D. Hallmark 75 AID 71 BYF 41 RH 19 BKJ 2 IA 29 BCW 116.

SOUTHERN TEXAS — SCM, D. H. Calk, W5BHO — W5OW makes the BPL in a big way; he can QSP to Panama, Alaska, Philippines, Hawaii, Guam and Shanghai, China. W5MN has portable W5BTI. W5YL wants more schedules. W5BWM keeps 5YL hot. W5PF is working DX. W5CRI reports Special Delivery mail. W5AMW is building MOPA. El Paso: W5NT is new OBS. W5ES and W5BQU send nice reports. W5CFI has a c.c. '52. W5CDG is out of town. W5CGI is heard now and then. W5GI wants traffic. W5DE uses remote control. W5BNJ is using c.c. '10s. W5AOT is c.c. with '03A. W5AUI is going crystal. W5AFS says nil with him. W5AFN sends OBS regularly. W5AEC is QRL KTSM. W5AEP is QRL auto work. Beaumont: W5APX has 'phone on 3.9 mc. Kerrville: W5BKE sends nice traffic report. College Station: W5AQY sends report on Texas A. & M. Radio Club. Austin: W5VV reports QSO with K6BOE and the op. of W5VV, who is on a tennis tour. Port Arthur: W5YH reports by radiophone. W5BUZ is building a 'phone. W5BRM is QRL Lamar College. W5CNH and W5BCF are on again. W5AZS went to sea. W5BOX is the proud owner of an FB receiver. W5BKF is the LNCS, A.A.R.S. Brownsville: W5ATU sends FB report. Corpus Christi: W5BZW sends good report. W5CHN is working "J's." W9CHD is located here. W5HP aspires to a commercial ticket. Houston: W5BTD sends FB report. W5ADZ is building crystal. W5BDI is building MOPA. W5TD moved to a better receiving location. W5ON is new OBS. W5TG and W5BBG completed 250-watt c.c. rig. W5BBG is one of Houston XYLs. W5CLL is new call of W5CBV. W5AZR is going FB. W5BKW wants schedules. W5AFV is now owner of a 212 D. W5CEC is having receiver troubles. W5CER works ZLs. W5AHW is proud of a '52. W5AFC is QRL YL. W5BUB is now c.c. W5BGG is using c.c. on his 1.75-mc. 'phone. W5OX is QRL Police Radio KGZB. W5BHO received a card from W5LB, who is now W9IMD.

Traffic: W5OW 1301 MN 73 BKE 93 YL 25 AEV 24 BZW 14 PF 12 ADZ 7 TD 7 BDI 6 ON 16 AQY 28 VV 36 APX 10 BKW 3 BKF 4 ES 32 BQU 29 BNJ 12 CFI 6 ATU 4 YH 26 BTD 4.

CANADA

MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — VE1ER jumps to lead this month. VE1CY is now OBS for N. B. VE1EP entered the S.S. VE1BC is all set for 3.9-mc. 'phone in new QRA. VE1DH received his ORS. VE1DQ is sporting a new receiver. VE1CV works 3.5, 7 and 14 mc. VE1AE resigned as R.M. for N.B. VE1BO is going strong.

Traffic: VE1ER 129 EP 40 CV 38 BC 20 CY 57.

ONTARIO DIVISION

ONTARIO — SCM, H. W. Bishop, VE3HB — Please note the SCM's new QRA on page 5. VE3CP leads the tarffic score. VE3AD is close behind. VE3GT also makes the BPL. VE3LD appreciates the help of the Toronto gang. The Queen City Amateur Radio Club has a new transmitter built by VE3LJ. VE3WK says that the club will be on 3.5 mc. and 7 mc. for traffic and RC. VE3PN reports inactivity. VE3RT has moved to 3.5 mc. VE3MX has bumped into a bunch of transmitter trouble. Another prodigal returned in VE3GX. VE3AU is finding the amplification factor of an '01A. VE3ET will be located on an Island in Minnitaki Lake this winter. VE3JI is active. VE3LJ is QRL service work. Welcome an OT, VE3OO. VE3NU can be heard daily. VE3LN is burning up the ether. VE3RL is QRL experimenting. VE3IB will keep schedules on any band. VE9AL has a new SS receiver. VE3DW has a peach of a note. VE3WA is working FB DX. VE3OE, VE3FO, and VE3MY are new hams in Windsor. VE3OC works W7s on 'phone. VE3FJ works DX. VE3OM handles traffic. VE3LA is the main cog in the F.R.A. NET. VE3WX is a live wire in the Frontier Radio Club. VE3QB is QRL teaching school. VE3BU schedules VE3OJ. VE3DC is raising new antenna. VE3IA is on with new rig. VE3JU is interested in traffic. VE3KM is very active. VE3OF has an FB station. VE3OJ is a new man. VE3PG is an operator at CKOC. VE3HP is on 3636 kc. The new Amateur Club in Hamilton is going ahead. VE3OF and VE3JU are doing considerable work toward its success. VE3GL has a cracked crystal. VE3JS is going to 14 mc. VE3LS blew a filter condenser. VE3ON is an addition from Galt. VE3IH was in the SS Contest. VE3HC is getting good results. VE3DD is back from the OFB. VE3HZ is QRL YL. VE3GC is rebuilding MOPA. VE3KC is disgusted with Modulators. VE3WM is rebuilding a crystal job. VE3CM has moved upstairs. VE3FD is starting to stir. VE3LW is interested in electron coupled oscillators. VE3HB is getting good reports. VE3LD uses an old wet A battery for a weight at the end of his antenna, and VE3LQ has it figured as a new kind of voltage feed — hi. VE3DB is on 1.75-mc. 'phone. Ex-VE3SO is rebuilding. Harry, 2nd op at VE3HA, is getting ready for his own call. VE3HA is a new RM. VE3CH is at VE3HA's ivories again. VE3HO is at Canard River. VE3SA wants schedules with Montreal, Toronto and New York.

Traffic: **VE3**CP 809 GT 545 WX 269 IH 71 JI 70 DW 70 GX 42 HB 34 GL 27 LA 24 JS 25 IB 17 WK 15 9AL 10 OM 9 LS 7 QB 3 HP 3 HA 105 AD 794 SA 1.

QUEBEC DIVISION

QUEBEC — Acting SCM, John C. Stadler, VE2AP — VE2BB keeps the lead in traffic. VE2BT operates the Army station 2CIC. The following are on with crystal: VE2CO, VE2CU, VE2CX, VE2AG, VE2FD, VE2EC. VE2CA is getting across the pond with his 14-mc. 'phone. The Northern Electric gang comprises: VE2EE, VE2EW, VE2EX, VE2DX, VE2BH; all anxious to work hams of the Western Electric. VE2DY sticks to 3.5 mc. VE2BC has moved back to old QRA. VE2DR is on 7 mc. VE2GH roped his brother to the call of VE2FR. VE2AA awaits the R.I. to get on 'phone. VE2EK reports considerable activity in the St. Maurice Valley district. VE2AH does his bit on 7 mc. Welcome to VE2FE, VE2FF. VE2DW wants to meet somebody on 1.7 mc. VE2CM is installing his '03A Class "B." VE2AP was taken for a spin by VE2EM with usual results. 'Phone stations are doing well in the Quebec region. Boys! Don't blush unseen and waste your sweetness in the desert air; let's know about your activities.

Traffic: **VE2**AP 33 BB 151 BT 8 CX 5 CA 6 DR 16 AA 13.

VANALTA DIVISION

ALBERTA — SCM, C. H. Harris, VE4HM — VE4BD is getting out well. VE4BI visited Edmonton. VE4BV handled some traffic. VE4BZ is busy hunting bugs. VE4DQ is waiting for a 50-watter. VE4DR and VE4AB are active. YF at VE4DR is learning code. VE4EA built short-wave super. VE4EC is piling up score in local contest. VE4EO is getting good reports with De Forest H tube. VE4EW is on 3.5 'phone. VE4FJ has new receiver. VE4FR's crystal transmitter is stepping out well. VE4GY is able to spend more time on air now. The YF at VE4HM and a YL hope to have a license soon. VE4JK is on daily. VE4LQ is new ham at Edmonton. VE4LM is started at Drumheller. VE4GX is back at Medicine Hat. VE4DX is ready for winter season. VE4GD is erecting new antenna. VE4JI is rebuilding. VE4HQ is on steady. VE4CY has YLitis. VE4KI works out well with 3 feet high antenna. VE4GT is busy selling insurance. VE4DO is announcer at CFAC. VE4DT is QRL grain elevator business. VE4JJ is on occasionally.

Traffic: **VE4**BZ 64 BD 40 DQ 30 KI 24 DR 14 GX 11 JK 9 HQ 7 EC 7 EO 2 DX 2 HM 2.

BRITISH COLUMBIA — SCM, J. K. Cavalsky, VE5AL — Hurrah! for VE5HP — in the BPL. VE5AC is our chief Vancouver traffic man. VE5AM is on once in awhile. VE5AL wants to get back on 3.5 mc. VE5GS promises to be a traffic man. VE5GI is getting out nicely. VE5HJ is looking for traffic. VE5HZ and VE5HO are interested in traffic. VE5DO wants to get hooked up with the coast. VE5EC is getting his total back to normal. VE5HR is getting ready for 28-mc. tests. VE5GE is going again. VE5DQ is overloading the tube trying to find DX. VE5GT managed to get a traffic total before he had to go out of town. VE5FG was QRL the S. S. Contest.

Traffic: **VE5**HP 683 AC 76 EC 73 GT 43 AL 37 DO 6 AM 5 GI 9 GS 5 HO 3 HJ 2 HZ 3.

PRAIRIE DIVISION

MANITOBA — SCM, J. L. Green, VE4BQ — Election results at the M.W.E.A. annual general meeting are as follows: VE4AG, Hon. Pres.; VE4JF, Pres.; VE4FN, Vice-Pres.; VE4FP, Secy.; and VE4GC, Asst. Secy. We welcome three new stations, VE4LL, VE4LW and VE4PX. VE4DK has been QRL at the U. VE4DJ got his hooks on three VKs and a Zedder. VE4GC is a new ORS. Ex-VE4IS is now signing VE5GV at Bear Lake, N.W.T. VE4FN, VE4EF, VE4TD and VE4JB are heard occasionally. VE4BQ is leaving this Section for the North, where he will be operating for Canadian Airways, Ltd. Husky sigs are heard from VE4CI. VE4FT uses remote control. On 3.5 mc. we now hear VE4FU and VE4TD. Wanted — A Winnipeg schedule with Brandon; write VE4AC if interested. Two shifts are operating at VE4LH. VE4GC is pushing his 'phone up to 3.5 mc.

Traffic: **VE4FT** 16 KX 14 BQ 9 DJ 5.

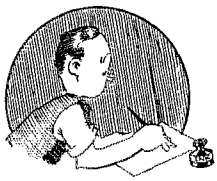
SASKATCHEWAN — SCM, Wilfred Skaife, VE4EL — Very pleased to state that response to Circular letter was as good if not better than expected. Thanks, gang. You will be pleased to know that from the lowest position in June we last month ranked second in Canada for report standing and third for traffic. Keep going, boys. VE4KA had nice QSO with G5VL on 14 mc. VE4IY is doing nicely with MOPA. VE4AZ had visit from VE4AI. VE4IJ is heard constantly. VE4ET with help of VE4AM is now on 3.5 mc. Look out for new hams, VE4KJ Tyvan, VE4LP Frobisher, and VE4DD Shaunavon. VE4BB expects to soon be full strength on MOPA. New schedules: VE4BB daily with VE4DT, VE4GR, VE4BZ. VE4CB with VE4FF, and VE4GC Winnipeg. Fill these in on your network chart. VE4JH is wiring 1.75-mc. 'phone. VE4BF started on electron coupled oscill. of Oct. *QST*. VE4ES has been on sick list — now OK. VE4GR took test message from G6UN. VE4CB is building 6 tube receiver. VE4AO enjoyed Sunday get-together as did your SCM.

Traffic: **VE4**BB 72 GR 67 HE 37 AU 28 EL 26 JH 20 AO 20 AT 15 DI 14 CV 12 GN 6 CB 6 AZ 6 BF 5 LI 4 AM 3 GO 2 FF 7 IG 4 HS 4 HX 15 EH 69.

Traffic Briefs

Which amateur band yields the most QSLs? W9CWD decided to investigate this question. For four months he sent a QSL card to each new station worked on the 3.5-, 7- and 14-mc. bands. The results tabulated for each band show 3.5 mc.: sent 48, received 27, 56% return; 7 mc.: sent 21, received 17, 81% return; 14 mc.: sent 97, received 70, 72% return. The total for all bands was 166 sent, 114 received, 68% return. The 7 mc. fellows are the best "QSLers"

W9BWJ, Paintsville, Ky., has been heard twice on the 3500-kc. band by ZL2CZ.



CORRESPONDENCE

The Publishers of QST assume no responsibility for statements made herein by correspondents

W. R. Robertson

40 21st St., Hermosa Beach, Calif.

Editor, *QST:*

Most of us no doubt read of the recent destruction of the freighter *Nevada* when she ran aground in the North Pacific, carrying to their deaths thirty-nine out of her crew of forty-two men, and of the heroic part played by her radio operator when he locked himself in the shack in order to repair the damaged transmitter and renew his SOS. But there were only a few of us who knew that W. R. "Russ" Robertson was W6BXS, and as enthusiastic an amateur as any.

We who knew him will always remember his sacrifice and feel proud to be called amateurs, for he more than fulfilled the "Amateur's Code" when he answered that last call.

— *Charles D. Perrine, Jr., W6CUH*

"The Copper Watch"

1428 S. Norton Ave., Los Angeles, Calif.

Editor, *QST:*

When the original NAA Gang arrived at what was to be the world-renowned station a little later, they found themselves some nine miles southwest of Washington, near the Arlington National Cemetery. Our nearest interurban jumping-off station had been called St. Johns, from a small Negro settlement just to the south of our station grounds; we promptly changed its name to "St. Radio"!

A three-phase 6600-volt 60-cycle power line was installed between our station and the nearest power house of the Potomac Electric Co., in the southern part of the city; three fine, husky strands of copper, about nine miles long.

Upon installing our main power transformers (local substation) in our basement, we called up the Potomac Electric and asked them to turn on the juice. The answer was "Right away." When, after waiting about 5 minutes, there were still no signs of life, we called up again only to be told they had cut in our line. That was odd! Upon investigation it developed that our three 9-mile long strings of copper had disappeared to within a few poles from St. Radio station; apparently someone who knew did themselves well at our expense.

There was an idea at first of having a "copper watch" patrol the line when re-strung, but the prompt application of 6600-volt a.c. rendered this unnecessary, and we finally had power after all.

Then we proceeded to place our ground net work.

This consisted of a belt of 5 or 6 parts of old trolley wire around the foundation walls of the building buried in a trench about 6 feet in depth. From this radiated a closely-spaced network of No. 12 bare copper wire, each ray being crossed by a series of concentric wires, each cross being spliced and soldered, the whole being buried in shallow trenches. The system had much the appearance of the conventional spider-web with the buildings at the center. Beside each of the foundation pedestals of our three towers we interred a 36-inch square plate of copper, which was tied into the nearest part of the ground net.

All in all, we used about 35,000 feet of wire; and, as it took some few weeks to accomplish this work, our dusky neighbors from St. Radio (thrifty folk) had ample opportunity to observe our work. They apparently thought it a shameful waste of good copper so promptly undertook to salvage as much as possible, greatly to the detriment of NAA.

As their praiseworthy efforts were discovered very shortly, we (the Old Gang) mounted guard over our precious copper, patrolling the grounds from 4:00 p.m. to 8:00 a.m. with .45 automatics strapped to our hips.

This "copper watch" was continued for some time after the grading contractor had completed covering up the trench system and seeded the surface to lawn.

— *W. M. Blumenkranz, Lieut. U. S. Navy, Ret.*

Once a Ham—

W9OP, Chicago

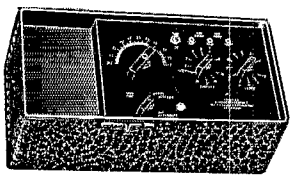
Editor, *QST:*

They all come back, don't they? I mean the old-timers who roared away with the old spark sets and who frowned on the little squeaky tube sets when they first came out. Those anemic tubes sounded too much like undernourished ducklings for your correspondent, so he deserted the old ham game for the wide-open sea. But an amateur who is one at heart can't stay away. So yours truly announces his return joyously. I used to be old spark 9UE in those glorious days of the 5-Kw.

LEEDS says:
It Pays to Watch Our Bargains

The biggest B C L development in years is the Lynch "No Stat" matched impedance, shielded lead in antenna system. Now you can eliminate man made static from your own and your neighbors B C L set at a reasonable cost. Incidentally "No Stat" systems will help cure B C L qrm troubles and gives your neighbors finer reception than ever. One antenna coupling transformer, one receiver matching transformer and a 50 foot shielded lead in, only **$2.95**

Complete with 100 foot shielded lead in, only **$3.75**



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We carry a complete stock of **NATIONAL** sets and parts, including the famous SW30 — the SW58 and the improved AGS Super-Heterodyne. National Midget Condenser prices have been reduced. **REMEMBER** our prices are the lowest in the country.

REL 278 band spread receiver, complete with 20-40-80 meter coils. Special **$25.95**

We are pleased to announce that the new **GENERAL RADIO RELAY RACK** is now in stock, in addition to the other new items illustrated last month. With standard 19" width, 45" high, it is readily adapted to table or floor mounting. Only..... **$15.00**

There is a **KENYON TRANSFORMER** for every amateur need. For example — tube to universal line, universal line to grid, universal line to universal transformer line, each..... **$3.30**

And the new double purpose 4 stage Class B 46 amplifier kit for use as a modulation system or public address amplifier, as described in January Radio News. Complete kit less tubes, only..... **$37.85**

Y cut Crystals 160–80 M. bands .1 of 1% accuracy	$4.25
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T lw pwrd xmtr in t Nov isu is gg ovr fb. Plnti ys's es o.t.s too r mkg ts new rig. Y not join t gng es put a modrn sig on t air om. Xmtr kit onli..... **$12.75**
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furnished complete—DeForest 430 tube, A and B batteries and 20–40–80 coils. 50 divisions pread on 20 meters — 35 divisions on 40 meters and 70 divisions on 80 meters. Unconditionally guaranteed.

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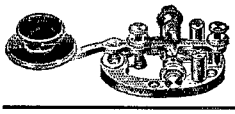

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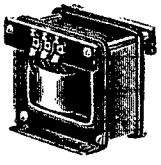

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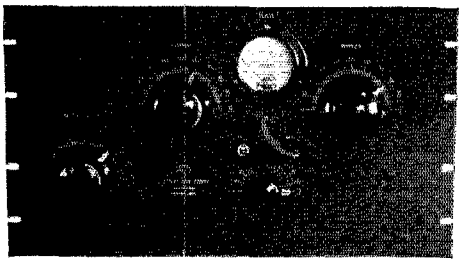
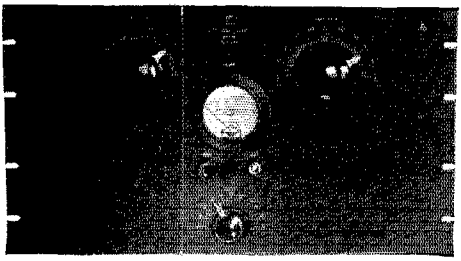
COMMERCIAL TYPE APPARATUS AT HAM PRICES



Cat. No. 316 Electron Coupled Oscillator and Buffer Amplifier. A basic unit that provides that characteristic crystal tone without a crystal and still allows change of frequency — Employs one type 24A oscillator and one type 59 amplifier — Can be used as buffer amplifier or doubler — Will deliver sufficient power to excite push pull 210's.



Cat. No. 315 Crystal Oscillator and Amplifier. This basic unit is designed to assure absolute frequency stability — Crystal oscillator employs type 47 tube — Amplifier uses a type 59 — Can be used as buffer or doubler — Delivers ample output to excite push pull 210's — Provides for plug-in crystal — Crystal and holder not included.

These oscillator-amplifier units are furnished on standard 19" panels, finished in black crystal lacquer. Single meter provided with plug reads plate current of each tube. Completely assembled, wired and tested.

Quotation and full data on request

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RADIO ENGINEERING LABS., INC.
100 WILBUR AVE., LONG ISLAND CITY
NEW YORK, U. S. A.

outfits when only one fellow could be on at a time! And we thought that was great stuff!

I notice that cantankerous old fossil "The Old Man" is still suffering from dyspepsia. Must be that lousy pipe he smokes. Bet the old Scotchman has the same pipe he had then. He still damns to the high heavens his brother hams as nitwits, jammers, CQ'ers, wave jumpers, etc., threatening them with the old mythical Rettysnitch and the Wouff Hong. Boy, that guy's memory is conveniently brief. He forgets how we hams of those so-called glorious spark days used to be on 300 and sometimes 400 meters because of poor wavemeters . . . that were FACTORY made! And were we broad? Dun't esk! And did we jam one another? Ask ole 9ZN and 9AU, and 9AO and, oh, any of the Chicago gang. There used to be unhealthy cliques who would steal into a powerful ham's backyard in the eerie dawn and cut down his antenna and uproot his chicken-wire ground system that had taken him weeks to construct. It got so we kept loaded shotguns close by the windows to ward off these nocturnal prowlers. Did we jam the commercials? We did. We even worked rings around them. We had DeForest tubes for reception and they had carborundum, besides all the operators on the Lake boats were former hams. The Old Man (caps out of deference to his extreme age) used to rave then as he does now about rotten fists and that delectable touch known as the artistic Lake Erie swing; so, Young Squirts, don't take him too seriously — he means well.

I find myself agreeing with the old buzzard, though, when he says there is less excuse for wave-wandering these days than there was in the old. With crystals and all the high-precision facilities available it is sort of criminal for a ham to be off-frequency. When we were off in those former days there were very few serious consequences, because commercial radio was in its swaddling clothes, and certainly not the highly efficient public benefactor it is today. But ham radio to-day is fifty times as interesting as it was then. Can you imagine a 1-kw. spark outfit working a VK? Hi!

I've been away from this stuff for a long time. Knocked around the world for more than ten years, did a stretch in the tropics where QRN really exists, but must not be mentioned by an operator because it would reveal him as a weakling. Where, in fact, I have seen ops go nuts because of Old Man X and start revolutions. S'help me . . . I'll let you in on that one sometime. Remind me. Also worked the big commercial coastal stations on the Eastern seaboard for some time, where we would take a flock off the wire in Morse and send them to the Berengaria or Levy in Continental, mixing 'em both up sometimes!

Finally drifted into the broadcast game, now working for CBS in Chicago. And now back into the ham game with both feet.

I get quite a laugh out of the OM when he mentions poor ham fists. Wish he could have sat with us at old WSE and copied the conglomeration of

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• WITH INDEXES •

THE list given below shows many exceptions, and as time goes on each yearly list becomes more incomplete. To have and to hold all available copies – wouldn't that be a good New Year's resolution? Need we stress their value as reference material?

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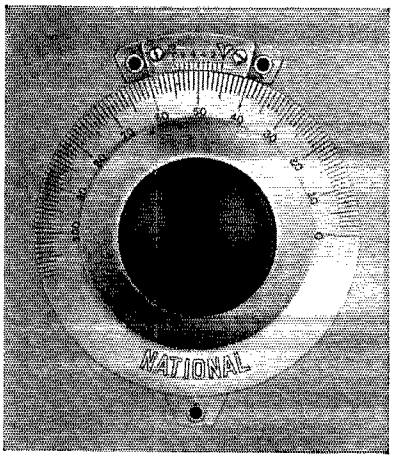
AMERICAN RADIO RELAY LEAGUE

WEST HARTFORD, CONNECTICUT

ACCURATE FREQUENCY METERS DEMAND ACCURATE EQUIPMENT



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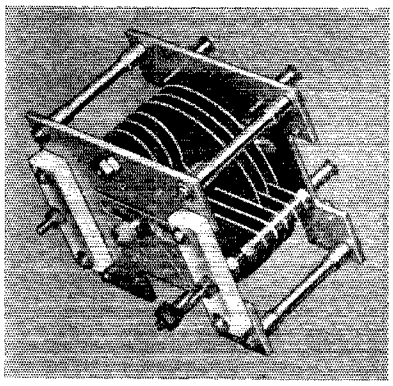
Solid German Silver, All Divisions Engraved

For maximum precision of operation, this NATIONAL type N Dial is being used more and more by amateurs and experimenters in receiving and transmitting equipment, frequency meters, etc. Engraved flush-vernier gives exact readings to 1/10 dial division. Insulated flexible hub-coupler assures permanent accuracy by taking all strain off dial itself, and at the same time insulates exposed metal parts of dial from the shaft. The original and matchless NATIONAL Velvet-Vernier Mechanism is used, of course, but with materially increased driving power, so that drive-slip is practically impossible. (National Co. Inc. makes a complete line of dials of all types. Protected by U. S. Patent Nos. 1,744,675, 1,653,875, 1,656,532, 1,713,146. Other patents pending.)



Type 40-75 — Frequency Meter Condenser

This special condenser is designed for use in amateur frequency meter and monitor circuits. Adapted for use in High-C circuits, thus avoiding changes in calibration which would otherwise arise from differences in tube characteristics, temperature, etc. Spreads 160 and 80 meter bands over 80 divisions with 100 division dial. Min. cap. 40 mmf., max. cap. 75 mmf.

Write for the new National Company 18-page catalogue.

NATIONAL COMPANY INC.

61 Sherman Street **Malden, Mass.**

fists that came into New York on American and foreign vessels. Each nationality had its own swing. At any time a good old Lake Erie swing would have been welcome. And some of those tropical Spaniards who were continually racing to certain doom! Especially when they got us into their own lingo! We used to have to turn Morse and Continental on them to quiet 'em.

You can say to the old buzzard that this American ham radio is a pretty welcome thing to me. But I want to keep my hand in the old traffic game, so want a few schedules around the country. I originate a lot of traffic for all over the States, but have a heck of a time getting it delivered. In this respect once more I find I coincide with T.O.M. Too many amateurs take messages with no intention of delivering them. I have had as many as one hundred undelivered messages. Get the Wouff Hong and gory Retty-snitch after these offenders, and don't scare the Young Squirt coming up who might make a good man in the future.

My crystal job covers all the bands, so youse guys let me hear from you *re* schedules, but don't answer this ad if it is against your principles to deliver and secure answers.

Best of everything to goode olde *QST* and Ham Radio.

— *John O'Hara, W9OP*

QST Helps Out

4002 Fir St., East Chicago, Ind.

Editor, *QST:*

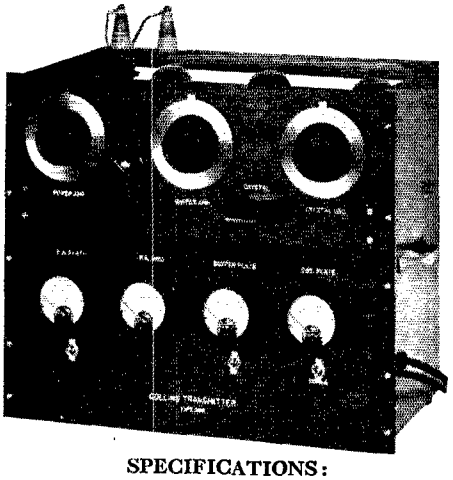
Some time ago *QST* ran a stray about some of my equipment that was stolen on August 6, 1932. I want to thank *QST* and the Editor for putting that stray in, because without it I would never have located the stuff. I will tell you how it happened.

About three weeks after the stray appeared in *QST* I received a letter from W9ANY saying that he had traded a 40-meter crystal for some fifty-watters to a fellow in this town. He had read in *QST* about my hard luck, so he asked me to describe the tubes. I did, and they corresponded to my description. He told me the name of the fellow that made the trade and I had him arrested. This chap confessed that he did the job, and he was faced with a three- to ten-year sentence. He returned the junk and I had the police let him off this time, but made it clear to him that if there is any more dirty work of that type I won't have any sympathy for him. He is just a young fellow and I imagine he learned his lesson.

So you see that *QST* should really get credit, as well as Mr. Kelley, of Kansas City, who was so kind as to let me know about the junk. I want to thank you again as an A.R.R.L. member.

— *Andrew A. Janiga, Jr., W9HPQ*

The COLLINS 30W



has won enthusiastic users throughout the world. Amateurs everywhere have put the 30W through the gruelling test of popular use—*and it has proved itself a winner.*

There are good reasons for its success: Correct design—Use of only the very best materials—A DX range equal to that of larger transmitters—And a price so attractive that it is no longer an economy to build your own transmitter from composite parts.

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Does your answer come easily, freely, briefly? No blame to you if it doesn't — amateur radio is a complex and diversified pursuit, and it cannot be considered in a word.

● The easiest way to answer that question is to suggest that your inquirer secure a copy of the League's special beginner's booklet. It is by far the best answer you could possibly give him, too, for the 32 pages of the new second edition of "How to become a Radio Amateur" outline the entire field of amateur radio, make learning the code easy, and tell how to build a simple station, with clear illustrations and easily followed building instructions — and there's concise dope on getting licenses and operating properly, too. In short, it answers the question — thoroughly, yet simply. An inexpensive introduction to amateur radio and preliminary to the Handbook. The price is 25c, postpaid. No stamps, please.

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Reg. Trade Marks: Vibroplex, Bug, Lightning Bug

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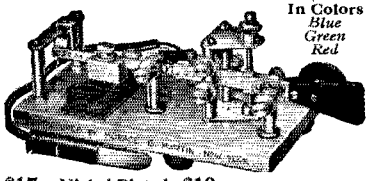

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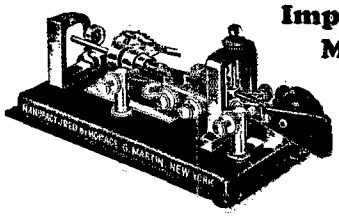

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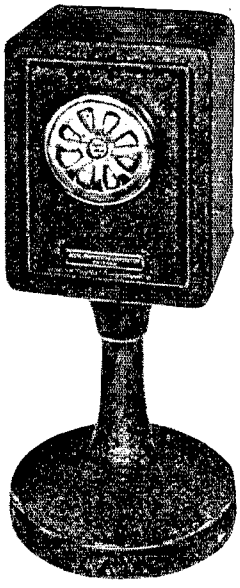

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In the Hills

915 N. 13th Ave., Seattle, Wash.

Editor, *QST:*

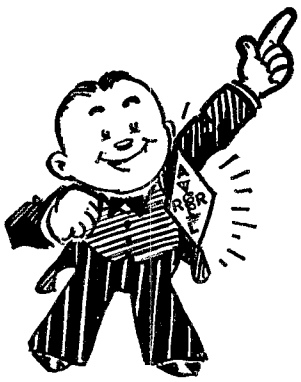
Much has been said in past issues of *QST* regarding the five-meter tests performed so ably by those very active "Back East" hams. The time is not so far in the past that similar thrills, "portably" speaking, were obtained by reception in the now more or less routine 7000-kc. band. How many amateurs have taken good receivers with them on their vacation jaunts into the hills? Wouldn't you like to have a location like that at home — no locals, no power leaks and other forms of "ham misery"? A spot where VK and ZL is local?

Just such a spot did we pick for our vacation. About seventy-five miles northeast of Seattle, at the foot of Mount Whitehorse and on the north fork of the Stillaguamish River is located W7BC, portable of W7BB. The shack is a three-room cabin, overlooking the river and about as pretty a spot as can be found in the Northwest. Fishing abounds in the river and various kinds of "upland" birds are in abundance. An amateur license and a hunting and fishing license, with a full larder — and there's your ideal vacation.

The receiver was installed, without misgivings, and we're off. At 1:00 p.m. local time, the first station logged was W3CXL, with an R8 signal that rattled the 'phones. The next — W8DFH, equally loud. In just exactly thirty-nine minutes, every district in the U. S. and all districts in Canada with the exception of the first were heard. At 6:00 p.m. K6AJA was pounding in R9 and at 9:00 p.m. ZL1AA, the first foreigner heard, was R7. At 11:00 p.m. in came OM2TG, with an R9 signal. From 11:00 p.m. to 2:00 a.m., sixty-one VK and ZL stations were logged. G5ML and SM6UA were heard, R5, at 7:00 p.m. At 6:00 a.m. VK6WR was logged R9. AC8NA, XU1U and VS6AG were R8 at the same time. Shortly after ZS2A was logged R6. Signals from KA1HR, KA1CM, KA1LG and KA3AA pounded in, R8, until 8:30 a.m. P.S.T.

One peculiar skip effect was noticed. Three stations in Spokane, roughly two hundred miles distant, were logged between 7:00 p.m. and 3:00 a.m. with sufficient volume to block the receiver. These stations apparently were not at all affected by the usual skip distance. Japanese hams and commercials started coming through at 10:00 p.m. and maintained the same volume until 4:00 a.m. when they faded completely out. AU1NM, Chita, Siberia, was R8 from 2:00 a.m. until 4:00 a.m. Both the J and AU stations normally should have not started coming through until 4:00 a.m. PK6ER in the East Indies was first heard at 2:30 a.m. and at 5:00 p.m. was pounding through R8. XX1CL, a ship near the Suez Canal, was heard R7, with considerable fading, up to 7:00 a.m. VP1FF in the Fiji Islands was at times R9, while this same station at W7BB is never more than R5. From 3:00 p.m. to 9:00 p.m. P.S.T. the W6's were a source of constant QRM. A number of Europeans could be heard in the background,

PROUD OF IT?



ARE you proud that you are an amateur — proud of your A.R.R.L. membership? Then proclaim it! Let the hams who meet you on the street, in the radio store, or traveling, know it. Wear your A.R.R.L. emblem!

The distinctive League emblem comes in four different forms. Its use by *members* is endorsed and encouraged by the League. Every member should endeavor to display the insignia of his organization in every possible way.

THE PERSONAL EMBLEM, in extra-heavy rolled gold and black enamel, just ½" high, supplied in lapel button or pin-back style, is recognized as the sign of a good amateur. Wear your emblem, and feel proud of having taken your rightful place in the radio fraternity. Either style, $1.00, postpaid.

THE AUTOMOBILE EMBLEM, heavily enameled in yellow and black on sheet metal, will gain you friends. On the road, traveling, it identifies you as a real amateur. 5 x 2½", holes top and bottom. 50c each, postpaid.

THE EMBLEM CUT, a mounted printing electrotype, the same size as the personal emblem, is for use by members on amateur printed matter, letterheads, cards, etc. $1.00 each, postpaid.

THE "JUMBO" EMBLEM, an attention-getter for the shack wall or that 100-footer, is a big yellow-and-black affair 19 x 8¼", same style as the Automobile Emblem. $1.25 each, postpaid.

The American Radio Relay League

West Hartford, Connecticut

GULF RADIO SCHOOL

Radiotelegraphy Radiotelephony

Radio Servicing

SECOND PORT U. S. A. } 844 Howard Avenue NEW ORLEANS, LA.

LOW RANGE FUSES

- *Littelfuses for Instruments:* Amps.: 1/100, 1/32, 1/16—20c ea. 1/8, 1/4, 3/8, 1/2—15c ea. 1, 2—10c ea. For milliammeters, ham rectifiers, etc. Use 1/8 for radio B circuits. *High Voltage Littelfuses:* 1000, 5000, 10,000 volt ranges in 1/16, 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1½, 2 amps. Renewable. Price 35c to $1.25 ea. Write for instructive bulletin 4-A
- LITTELFUSE LABS. 1772 Wilson Ave., Chicago

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AMATEURS

West of Rocky Mountains

We can supply all parts for the new circuits

Send for your Catalog of Nationally Advertised Transmitting and Receiving Parts at LOWEST PRICES

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RADIO SUPPLY CO.

H. A. Demarest, *President*

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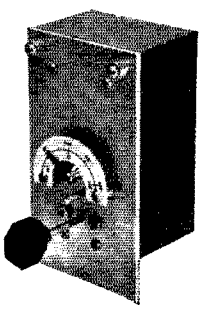
(*W6FBI located in Building*)

WHISTLING IN THE DARK



How many times have you sat in the dark, softly whistling "Goodbye Forever" while you gazed ruefully at your big '04-A which had glowed for the last time? Or perhaps it was your fifty watter or even your prized 210. In any case, it meant TIME and MONEY before the old transmitter would be perking again. Nine chances out of ten, the poor thing had not served 10% of its normal life—just a mistake in plate voltage—a slight error in neutralization and — POP!

THE SENTINEL MAGNETIC OVERLOAD CIRCUIT BREAKER

abolishes the danger of these and other errors, makes your transmitter fool-proof and insures 100% normal tube life.

Tripping range 50 to 400 m.a. Handles all amateur tubes and loads. Back of panel mounting. 5¾" x 3" x 2". Shipping weight 3 lbs. Breakers for higher powers on order. **SEND FOR CIRCULAR A.** Cash with order or C.O.D. only $5.85 plus postage.

ORDER ONE TODAY AND SAVE THOSE EXTRA DOLLARS

DON H. MIX & CO. BOX 403 BRISTOL, CONN.

BARGAINS

WESTON METERS (In Original Cartons)
MODEL 267

A.C. Voltmeters (Rect. type), 0-15v..... **$5.00**
A.C. Voltmeters (Rect. type), 0-150v..... **6.00**
D.C. Voltmeters 0-10, 15, 20, 25, 100, 150v, each.. **5.00**
D.C. Milliammeters 0-10, 25, 50, 100, 300, 500, each **5.00**
D.C. Milliammeters 0-1. (1000 ohms per volt) each **5.00**
D.C. Ammeters 0-1, 2, 3, 5, 7.5, 15, each..... **5.00**

TYPE 301 WESTON METERS

D.C. Voltmeters 0-10, 100, 150, each **$4.00**; 1000v **12.00**
D.C. Milliammeters 0-5, 10, 25, 100..... **4.00**
D.C. Ammeters 0-1, 10..... **4.00**
D.C. Milliammeters 0-1. (1000 ohms per volt).... **5.00**
A.C. Voltmeters 0-15 (Rect. type) **$5.00**; 150v.... **6.00**
A.C.–D.C. Universal All purpose A.C. & D.C. volts 0-1000 (4 scales) Milliamps and ohms direct .. **8.00**
Wire wound resistors 1% acc. for above, set..... **8.00**
Model No. 425 Thermo-Ammeters 0-1.5, 2, 5, 10, 15, 20..... **5.00**

NOTE: WE REPAIR ALL MAKES OF METERS REASONABLY

Send for list of AMERTRAN, J. & A., CARDWELL, HAMMARLUND, DUBILIER, FARADON parts. Many others at LOW PRICES

RELAY RACKS (ASK for Blue Print)..... **$8.00**
Bakelite and Steel panels (any size). *Write us.*
Crystals: 1" square Calib. 1% 80 or 160 Mtrs..... **2.50**
100 Watt CW Trans. Comp. with power supply.. **400.00**

Write for Prices on other Equipment

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***Phone:* SEELEY 1264**

PASSING *the* EXAM
is more important than merely taking it

MAKE sure you do not flunk out; be prepared for any question you may be asked. Typical questions, and their answers, are given in the new reprint of *QST*'s popular articles on "Passing the Government Examination for Amateur Operator's License." Originally these articles appeared in the January and February, 1930 issues; so popular were they that the entire back copy supply of these issues was exhausted within a year. Rewritten, they were again published in October and November, 1931 and reprints prepared for distribution. This supply has again been exhausted, and now —

Revised in terms of latest amateur practice, with complete information on the new amateur regulations, a new reprint of the "Passing" articles is ready for distribution. In convenient, economical pamphlet form, you can find the answer to every exam question in it. 20c per copy postpaid. No stamps, please.

***The* American Radio Relay League**
West Hartford, Connecticut

but extremely loud signals and poor notes made it impossible to get their calls. Roughly, there were at least fifty W6 and W9 signals with sufficient strength to block the receiver.

This letter is not meant to start a general movement of all hams for the hills, but what a relief after the crowded city with its various sources of QRM. Even in this location, with the nearest ham, "radiously" speaking, fifteen hundred to a thousand miles away, considerable interference was experienced from broad and rough signals. Let it be noted that the improperly tuned d.c. signal caused as much, if not more QRM than the r.a.c. signal. Several so-called d.c. signals were heard to bawl-out an r.a.c. signal that was just 100% better than this "1932 d.c. pest." Of all the signals logged, only about fifty percent actually complied with the regulations of our government. And what a "swell feeling" to hear a real operator after listening to the "r r r ok ok ge om tks for the vy fb call" variety. After a few turns over the 40-meter band it is quite apparent that a little more space in *QST* on decent operating procedure would be far from wasted. Not only would the good operator benefit, but the "lid" would find the fun of his QSO's doubled and the number of them increased. Give it a little thought, then see what results you obtain.

— *Edwin R. Stevens, W7BB-BC*

ELECTION NOTICE

To All A.R.R.L. Members Residing in the PACIFIC DIVISION:

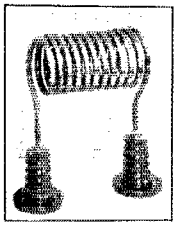
1. You are hereby notified that Clair Foster has resigned as A.R.R.L. Director from the Pacific Division. You are also notified that a special election for A.R.R.L. Director is about to be held in the Pacific Division to fill the remainder of the 1932–1933 term left vacant by this resignation. Your attention is invited to Section 1 of Article IV of the constitution, providing for the government of A.R.R.L. affairs by a Board of Directors; Section 2 of Article IV defining their eligibility; and By-Laws 10 to 19 providing for their nomination and election. Copy of the Constitution and By-Laws will be mailed any member upon request.

2. The election will take place during the period between January 15 and March 1, 1933, on ballots which will be mailed from Headquarters in the first week of that period. The ballots will list the names of all eligible candidates nominated for the position by A.R.R.L. Pacific Division members.

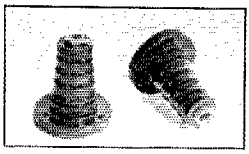
3. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members of the Pacific Division have the right to nominate any member of the League in that division as a candidate for director therefrom. The following nominating form is suggested:

Dite che l'avete visto nel *QST* — Ciò vi identifica ed aiuta *QST*

NEW INSULATORS
FOR
PLUG-IN COILS—STAND-OFF—LEAD-IN



General Radio has designed a new series of jumbo heavy-duty insulators for amateur and experimental use. Heavily moulded of brown glazed porcelain, 2¾ inches high, 2½ inches diameter at base, 1 3/16 inches top diameter, thick corrugated walls. Supplied with three mounting screws and lead washers. Ideal for use in the amateur's shack, for transmitter, antenna lead-in, high-voltage wiring, switches, inductance supports, etc.



THREE TYPES

Jack-Top Stand-Off — (upper illustrations) top hole ¼-inch diameter — fitted with new G.R. heavy-current Type 674 Jack — ideal support for any plug-in transmitter coil — complete with jack — **Type 627 — 60 cents.**

Plain-Top Stand-Off — top hole ¼-inch diameter — for general stand-off use — antenna lead-in support — lightning or transfer switch mounting — any place in the amateur station where high-voltage insulation with great mechanical strength is desired — **Type 628 — 30 cents.**

Lead-In Assembly — (illustrated at lower right) complete lead-in unit — two Type 628 Insulators — 15-inch length of ¼-inch threaded nickel brass rod — with brass and lead washers, nuts, mounting screws — **Type 629 — 90 cents.**

Sent post paid to any point in the U. S. or Canada if cash accompanies order. Address: General Radio Company, 30 State Street, Cambridge, Massachusetts, or our San Francisco Branch at 274 Brannan Street.

GENERAL RADIO CO.

INSTRUMENTS OF PRECISION AND DEPENDABILITY

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YOUNG MEN wanted to train as radio operators; we prepare for U. S. Govt. license; send for 40-page catalog; established 1899. Oldest, largest and best equipped school in N. E. 170 Lic. graduates in 2 yrs. Investigate.

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EVERY ITEM FULLY GUARANTEED

210, 281, 250 type tubes—triple tested	$ .89
CeCo make 866 M.V. Rectifiers, new	1.25
Magic Home Microphone—with switch and 15 ft. lead	.65
Steinite 30 Hy. cased Filter Chokes	.25
Brand new tubes—6 months unconditional guarantee—types 46—$.69; 56—$.59; 57 or 58—each $.75; 55—$.75; 82M—$.69; 80—$.45; 45—$.50; 35—$.49	
871 M.V. Rectifier—new—6 months guarantee	1.39
Filament transformers: 2½ V. at 12 amp. c.t. and 5 V. at 2 amp. c.t.	1.50
2½ V. at 12 A. c.t.; 2½ V. at 3 A. c.t. and 5 V. at 2 A.	1.65
Rubber Covered Lead-in copper wire—50 ft.	.25
Lacquered Flex. Copper Filament Wire, heavy insulated—colors—25 ft.	.25
Peerless Pr. Transf. 2½ and 5 volt c.t. windings 325 volts plate, uncased	1.49
U. S. Radio Cased Pr. Transf. 2½ and 5 v. c.t. windings, 350 v. plate	1.69
Echophone Pr. Transf. 2½ and 5 v. c.t. fils. 325 v. plate, semi-cased	1.49
Majestic Filter Chokes	1.19
Majestic Plate and 80 Fila. Transf.	1.25
Majestic P.P. Output Transf.	1.19
Genuine Victor Filter Choke—30 Hy. 150 M.A. 200 ohms	.35
Victor "ABC" Pr. Transf. 6-226, 1-227; 2-45's and 1-80	1.35
Victor P.P. Input and Output Transf. models R-32, R-52, RE-45 and RE-75	.59
Victor Audios for above models	.39
Victor Condenser Blocks for above models	.79
Victor Power Amplifiers: 1-226, 1-280, 2-245 P.P.	7.50

Write for prices on all Nationally advertised radio parts.
20% deposit on all C.O.D. orders. Postage extra.
2% bonus allowed on all orders above $5.00 if all cash is sent with order.

This is a REAL "Ham" outfit fellows—Shoot all your orders to us, and watch your savings grow.

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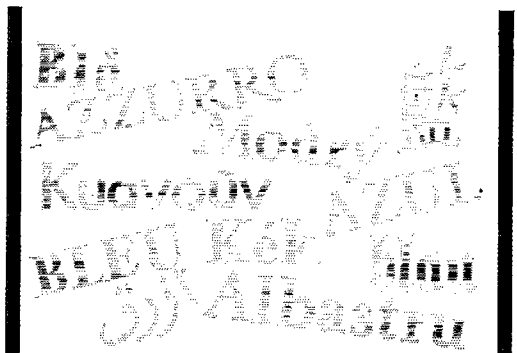

De Rola

CRYSTALS

Highly polished 1" x 1⅛" blanks guaranteed oscillators. Approximately 4000 to 2000 kc., $2.50; approximately 1500 to 450 kc., $2.00; ground to frequency 1 part in a thousand in amateur bands, $5.50 postpaid.

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BOUND VOLUME XVI *of QST*

WE have now a limited number of copies of Bound Volume XVI of *QST*. Vol. XVI comprises the entire 1932 series of *QST*. This volume is made up of two books or sections, each containing six issues of *QST* and index. This volume is handsomely bound in red cloth and with gold imprint.

The complete volume is priced at $5.00, postpaid.

Better act quickly — only a few copies available.

QST
38 LaSalle Road
West Hartford, Connecticut

(*Place and date*)

Executive Committee,
American Radio Relay League,
West Hartford, Conn.

Gentlemen:

We, the undersigned members of the A.R.R.L. residing in the Pacific Division, hereby nominate ..... of .....
as a candidate for director from this division for the remainder of the 1932–1933 term.

(*signatures and addresses*)

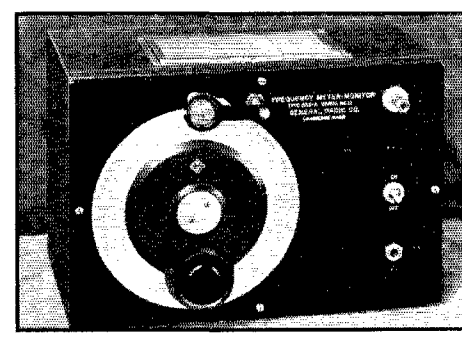
The signers must be League members in good standing. The nominee must be a League member in good standing and must be without commercial radio connections. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of January 15, 1933. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one such petition.

4. This election is the constitutional opportunity for members to put the man of their choice in office as the representative of their division. They are urged to take the initiative and file nominating petitions immediately.

For the Executive Committee:
A. L. BUDLONG, *Acting Secretary.*
West Hartford, Conn., November 12, 1932.

New Frequency Meter-Monitor

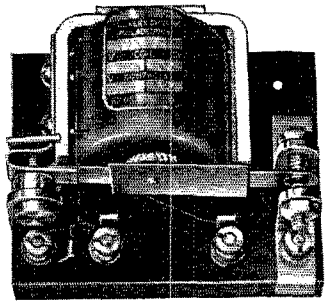
THE combined frequency meter and monitor for the amateur bands shown in the accompanying photograph has just been placed on the market by the General Radio Company. Conforming to general amateur practice, the meter covers the 1715- to 2000-kc. band and delivers usable harmonics through the 56-megacycle band. The circuit is a Colpitts with electron coupling



and full voltage stabilization, the latter being obtained by means of a voltage divider. It is stated that the working accuracy of the meter will be better than 1/10 of 1%.

The tuning dial is a 6-inch 300-division friction-drive machine-engraved type, supplied with a magnifying glass which makes it possible to read to one part in 1500. The panel is ¼-inch aluminum, crackle-finished and engraved. The walnut cabinet is lined with sheet copper. The meter comes equipped with a 24-A tube but without filament and plate voltage sources. It is intended to be operated with a 90-volt plate supply.

Merry Xmas and a Happy New Year FM M & H OM



Vacuum Tube Relay

Relay type CXB-51 is an ultra-sensitive unit designed for direct current in the coil circuit and either direct or alternating current in the contact circuit. It has single pole double throw contacts, making one circuit when the coil is energized and another circuit when the coil is de-energized. The coil has a resistance of 10,000 ohms, and it will safely carry currents up to 18 milliamperes. Adjustments are provided that will cause the relay to operate on any desired current value down to less than one milliampere. This unit is particularly adapted to operation in the plate circuit of small vacuum tubes. Contacts are rated at 2 amperes at 110 volts AC.

Size 2 1/8" long x 2 1/4" wide x 2 1/8" long.

Dunco Relay, Type CXB-51 — Your Cost, $5.00

SOME OF OUR REGULAR BARGAINS

Lamb Single Signal Super kit of parts only	$65.00
I. F. and Audio channel kit only	$47.00
National SW3 complete with coils	$32.34
New Cardwell band-spread condenser type 518	$2.70
Mercury thermo-regulator for ovens 50°C	$4.00
Western Union Telegraph keys tungsten contacts	.95
Genuine Western Electric Navy head sets (radio)	$2.50
Aerovox 5000 volt .002 mica condenser	$1.07

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512 MARKET STREET PHILADELPHIA

36 Years of Service. Buy with Confidence

NEW 1933 CORNELL CATALOG

Cornell

A complete line of oil and electrolytic transmitting condensers described in our new 1933 Catalog. Sent free on request.

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Long Island City *New York*

1882 *FIFTY YEARS* 1932

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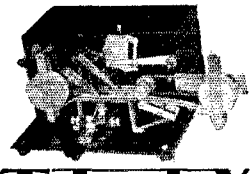
"The best Transformer money can buy"

New Way to Learn the Code

Make Your Own Records

Easy to Make
Easy to Read
with

The NEW MASTER



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The only instrument ever produced that will record your own sending in visible dots and dashes and then repeat it to you audibly on headphones. Revolutionizes the teaching of code — makes learning simple, fascinating and rapid. No experience necessary. Designed for U. S. Signal Corps. Marvelous say radio and electrical engineers. Loaned with COMPLETE CODE COURSE without additional cost. Write today for folder Q-13 giving full particulars.

TELEPLEX CO.
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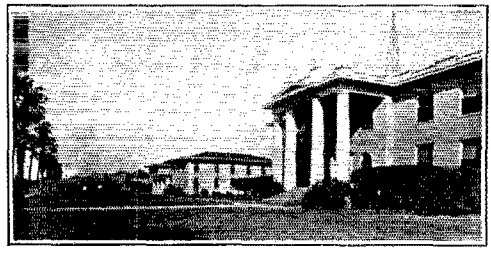

In 3 to 7 months we train you to secure government license. Course consists of Wireless Code, Radiophone, Microphone-Studio Technique, Television, Service, Police, and Aeronautical Radio. We are authorized to teach Radio Corporation of America Inst., Inc., texts. Return coupon for details.

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QST Oscillating Crystals

"SUPERIOR BY COMPARISON"

SINCE 1925

COMMERCIAL AND BROADCAST STATIONS

We are at your service to supply you with HIGH GRADE CRYSTALS for POWER USE, said crystals ground to an ACCURACY of BETTER than .03% fully mounted in our Standard Holder. TWO DAY DELIVERIES. Prices as follows:

FREQUENCY RANGE	
100 to 1500 Kilo-cycles	**$40.00**
1501 to 3000 Kilo-cycles	**$45.00**
3001 to 4000 Kilo-cycles	**$50.00**
4001 to 6000 Kilo-cycles	**$60.00**

Special Prices Quoted for Quantities of Ten (10) or More Crystals

AMATEUR BAND CRYSTALS

Prices for grinding crystals in the Amateur Bands below are for a crystal ground to within 10 Kilo-cycles of your specified frequency unmounted. Mounted in our Standard Holder **$5.00** additional. Frequency calibration of the crystals are BETTER than .1%. Immediate delivery.

1715 to 2000 Kilo-cycles, **$12.00** each. *Two for $20.00*
3500 to 4000 Kilo-cycles, **$15.00** each. *Two for $25.00*

LOW FREQUENCY CRYSTALS

Low frequency crystals available to as low as 13,000 CYCLES. Prices upon receipt of specifications.

SCIENTIFIC RADIO SERVICE

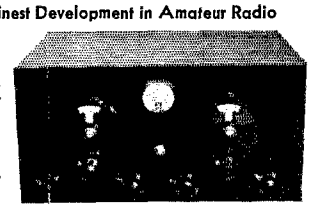
"The Crystal Specialists"

124 Jackson Ave., University Park, Hyattsville, Md.

SINGLE SIGNAL RECEIVERS

The Latest and Finest Development in Amateur Radio

Built to order. Complete in one unit, including quartz crystal filter, 2-stage I. F. amplifier and power audio stage. With 4 sets of band-spread coils, **$225.** Set of 8 selected tubes **$8.75.** Special heavy duty powersupplyunit **$35**



Custom built radio equipment, to QST or your own specifications

HENDRICKS & HARVEY

408 Main St. **Hartford, Conn.**

PREMIER

CRYSTALS

Cut from the Finest Quality Brazilian Quartz
UNCONDITIONALLY GUARANTEED
All Calibrations made with General Radio Frequency Standard and Checked with Bureau of Standards Transmissions and U. S. Naval Observatory Time Signals.

New Reduced Prices — Finer Accuracy of Calibration

80 and 160 METER BANDS, "X" or "Y" cut, our calibrations guaranteed accurate to .001%:—
Approximate frequency specified by you.....$5.00
+ or — 5 Kc. of frequency specified by you..... 7.50
40 METER BAND, "X" cut, random frequencies within the band..... 8.00
40 METER BAND, "X" cut, within ½ of 1% of frequency specified by you.....10.00
PLUG-IN DUSTPROOF HOLDERS..... 2.00
175 Kc. STENODE CRYSTALS..... 3.50
BROADCAST CRYSTALS — With Holder.....42.00

Crystals of All Descriptions Made to Order — Prices upon Application

PREMIER CRYSTAL LABORATORIES, INC.
53 Park Row **New York City**

Each meter is calibrated against the General Radio primary frequency standard at points 25 kilocycles apart in the 1715-kc. band, the calibration being recorded on a chart on top of the cabinet. This chart also shows all the harmonics which fall in amateur bands. A dozen special curve sheets, providing space for a calibration 300 divisions long with ordinates marked for the fundamental frequency of the meter and all amateur-band harmonics, also are supplied with the meter.

Financial Statement

BY ORDER of the Board of Directors the following statement of the income and expenses of the American Radio Relay League, Inc., for the third quarter of 1932 is published for the information of the membership.

A. L. BUDLONG, *Acting Secretary*

STATEMENT OF REVENUE AND EXPENSES FOR THE THREE MONTHS ENDED SEPTEMBER 30, 1932

REVENUE		
Advertising sales, *QST*	$10,231.27	
Newsdealer sales, *QST*	10,690.28	
Handbook sales	3,717.92	
Beginners booklet sales	820.65	
Membership dues	9,451.73	
Membership supplies sales	1,442.29	
Interest earned	795.08	
Cash discounts earned	131.86	
Bad debts recovered	213.78	
		$37,494.86
Deduct:		
Returns and allowances	$ 4,129.37	
Cash discounts on sales	152.68	
Exchange and collection charges	26.95	
	$ 4,309.00	
Less reduction of provision for *QST* newsstand returns	24.34	
		4,284.66
Net revenue		$33,210.20
EXPENSES		
Publication expenses, *QST*	$10,665.76	
Publication expenses, Handbook	1,606.02	
Publication expenses, Booklet	278.20	
Membership supplies expenses	757.02	
Salaries	17,864.15	
QST forwarding expenses	688.46	
Telephone and telegraph	364.39	
Postage	1,663.21	
Office supplies and general expenses	1,560.33	
Rent, light and heat	1,030.07	
Traveling expenses	1,277.14	
Provision for depreciation	291.81	
Communications Department field expenses	125.15	
Headquarters station expenses	72.31	
Bad debts charged off	116.45	
Federal tax on checks drawn	4.10	
Total expenses		$38,364.57
Net loss from operations		$ 5,154.37

Information Service Rules

PROMPT handling of inquiries concerning amateur equipment and problems will be greatly facilitated if the following rules are ob-

If you want to be a High Speed, Expert Operator write CANDLER for Free Advice

GET YOUR SPEED where the Champions got theirs

If you want to copy press — send perfectly at 35 wpm or more with bug or key — copy 3 to 5 words behind — O. K. instantly — write Candler for free advice. THE CANDLER SYSTEM of High Speed Telegraphing trains your Brain, Muscles and Nerves to CO-ORDINATE in doing fast, accurate work. It gives you CONFIDENCE, natural CONCENTRATION and banishes Nerve Strain. Original CANDLER METHODS have developed over 45,000 of world's fastest Morse and Radio operators including the champion.

TELEGRAPH-TOUCH-TYPEWRITING — only method for operators. Shows how to use "mill" in receiving.

FREE *advice*. If you are a beginner and want to learn code the scientific way, or if you want to become a real EXPERT, write Candler and receive the benefit of his 20 years' experience in developing EXPERTS. Your questions will be answered promptly and personally. No obligation.

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Scientific Method, High Speed Telegraphing

3 Times World Champion Operator Candler Trained

"By applying Candler System methods I won the Radio Telegraphic Championship of the World 3 consecutive years at 50, 55 1/10 and 56½ wpm.

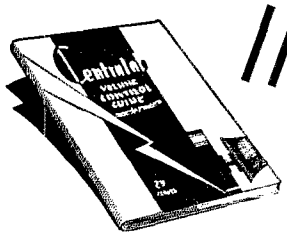
THEODORE R. MCELROY, *Official Radio Champion of the World, Retired, Boston.*

Join C. S. Code Guild. Regular Daily Practice Schedules on Short Waves. « Get Details

WALTER H. CANDLER World's Only Code Specialist, Instructs You Personally

Candler System Co., Dept. 51
6343 South Kedzie Ave. Chicago, Illinois

GET THE *new* //



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We want every service man to have a free copy of this valuable book. Illustrated, it contains 64 pages of interesting, necessary information. Priced regularly at 50c . . . it is yours for the asking.

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- **CENTRALAB Volume Controls for Replacements**
- **CENTRALAB Fixed Resistors**
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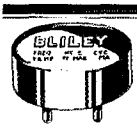
Centralab
CENTRAL RADIO LABORATORIES
MILWAUKEE, WIS.



AND NOW HOLDERS $1.50

New BLILEY crystal holders are designed to meet the demand for higher quality and lower prices. Made of molded bakelite — neat, light, compact. Greater crystal efficiency — moisture-proof — chromium electrodes. Plugs into standard tube socket. Takes crystal up to 1 1/32". List, $1.50.

For accurate, steady, and reliable transmitter frequency, use the new BLILEY quartz crystals. These power-type (x-cut) oscillators can be quickly supplied by your dealer to within 0.1% (several Kcs) of specified frequency and include operating instructions, temperature-frequency chart, and guarantee. 40, 80, and 160 meters — any band, any frequency — $5.50.

Progressive dealers everywhere sell BLILEY crystals and holders

BLILEY PIEZO-ELECTRIC COMPANY
Masonic Temple Bldg., Erie, Pa.

THE ELECTION IS OVER!

Are you ready for PROSPERITY?

Have you made use of your spare time? Do you know the basic PRINCIPLES of Radio?

You will want RAMSEY'S RADIO BOOKS

EXPERIMENTAL RADIO
(255 pages, 168 figures, 128 experiments.)
By *R. R. Ramsey*, Prof. of Physics, Ind. Univ. The experimenters' manual: Measurements, Tests, Calibrations, with ordinary radio and physical apparatus. "Measure and know."

FUNDAMENTALS OF RADIO
(372 pages, 402 figures.)
Modern radio explained with a minimum of mathematics. "You find it in Ramsey's." Experimental, $2.75. Fundamentals, $3.50 postpaid.

RAMSEY PUBLISHING CO.
Bloomington Indiana

Little Willie's crystal
Wouldn't oscillate consistently;
So he got a Handbook—
Now it shakes itself persistently.

●

Moral

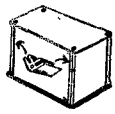
Send a dollar to-day for your copy of the Radio Amateur's Handbook 242 pages of invaluable ham dope.

AMERICAN RADIO RELAY LEAGUE, INC.
West Hartford, Conn.

Aluminum Box Shields

Genuine "ALCOA" stock, silverdip finish. 5x9x6..**$1.75** 10x6x7..**$2.95**

ANY SIZE TO ORDER



Do not compare prices! We are pioneers in this field. Our silver-dip finish is washable; does not show finger prints and we do not sell zinc under fancy-alloy names to fool you!

·W2FZ·

Something new! Your call letters on **BLACK** aluminum ribbon. Looks like engraving on bakelite.

FULL SIZE 3"..5c, 4"..10c, SAMPLE 8c POSTPAID

BLAN, the Radio Man, Inc.
177 Greenwich Street New York City

Special
EMBLEMS
for
HANDY'S HENCHMEN

All the King's horses and all the King's men couldn't have more attractive colors than those available only for

Section Communications Managers
Route Managers
Official Relay Station Appointees

OFFICIAL A.R.R.L. EMBLEM *in*
Special red color for the S. C. M.
Special green color for the Route Manager
Special blue color for the Official Relay Station appointee

Note: Red and green colors in pin type only. Blue emblem available both in pin and lapel button types.

$\frac{3}{8}$" size *$1.00 each*

AMERICAN
RADIO RELAY LEAGUE
West Hartford, Connecticut

served when writing to the A.R.R.L. Technical Information Service:

1. Before writing, consult *The Radio Amateur's Handbook* and your files of *QST*. Nine times out of ten you will be able to find the answer in *QST* or the Handbook.
2. If reference is made to the Handbook, mention the page and the edition to which you refer. If reference is made to *QST* mention the page and issue you have in mind.
3. Write on one side of the paper only, and use a typewriter if possible.
4. Number the questions and make a separate paragraph for each question. Make the questions as brief and as direct as possible.
5. Make diagrams on separate sheets of paper and fasten them to your letter with a pin or paper clip. All diagrams should be schematic — do not send pictorial diagrams.
6. Print your name and address in full on each sheet of paper. A return address on the envelope is not sufficient, as the envelope is destroyed by the office manager as soon as the letter is opened.
7. Keep an exact copy of your questions and diagrams, and mention that you have done so.
8. Do not ask for opinions on, or comparisons of, business concerns or their products.
9. Enclose postage for the reply but do not send an envelope. It is much more convenient for us to use our own envelopes with our stationery.
10. Address all questions to the Technical Information Service, American Radio Relay League, 38 La Salle Road, West Hartford, Conn.

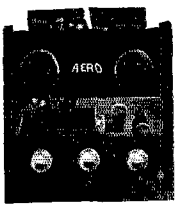
Any back copies of *QST* to which we refer you may be obtained from our Circulation Department for twenty-five cents each.

The observance of the above rules will be mutually beneficial.

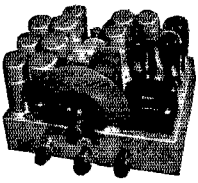
I. A. R. U. News

(Continued from page 56)

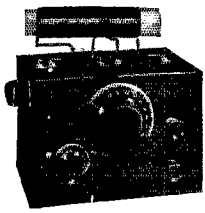
rather sounds like it! .. .. .. Dalton Atherton, W6CTP, worked his recent WAC with a single '71A in Hartley, excepting Africa, which required high power — one type '10 .. .. .. But W6EGH worked WAC seventeen times in the first twenty days of October .. .. .. On three occasions he did it in less than ten hours; once in three hours and seven minutes .. .. .. The R.S.G.B. has promised coöperation with the Air Ministry during a projected flight from England to Cape Town .. .. .. Assistance was also assured the R.E.F. during November for a scheduled flight from France to Sumatra .. .. .. OXXE, plowing the Atlantic and last known to be bound for the West Indies, is the ocean call of Otto Petersen, OZ7AG .. .. .. The Danish ship operates near 14.4 mc. with a 500-cycle note, gives nice hammy QSO's .. .. .. Two consistent VK DX stations are VK3WL and VK5HG, the former having worked 71 countries, the latter 87 .. .. .. European hams wishing to contact VK should look for them at 2000–2130 G.C.T., the time these stations QSO Europe.



AERO TRANSMITTER
15 to 30 Watts
Complete Phone and C. W. Transmitter $39.50
Transcontinental Transmission
Price Less Tubes and Power Pack
Complete power pack for this transmitter. *Price*.....$14.75
Complete set of 6 tubes for this transmitter..... 12.85
Write for quotations on special transmitters built to your specifications

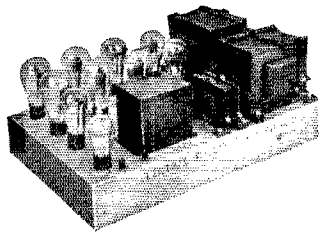


AERO INTERNATIONAL ALL WAVE 11-TUBE SUPER-HETERODYNE DELUXE
Completely assembled with two matched full dynamic speakers from 15 to 550 meters. One-dial control. No plug-in coils. Latest superphonic tubes.
Attention Hams! This set can be furnished for operation on the ham band only, for $10.00 extra.
Price $29.75



AERO WORLDWIDE 1-TUBE SHORT WAVE SET
For Headphone Operation
Listen in *direct* to London, Paris, Berlin, Buenos Aires and other broadcasting stations throughout the world via short waves. WORLD-WIDE RECEIVER gets 14 to 550 meters. Aero 2-Tube Short Wave Set, $8.75. The same as above set but it has one stage of audio frequency added to it.
Aero 4-Tube Midget Radio....$10.90
Aero 5-Tube Midget Radio.... 11.90
Aero 6-Tube Super-Heterodyne 18.50
Send for catalogue
Price $5.95

CHAS. HOODWIN CO., 4240 Lincoln Ave., Dept. T-8 Chicago



Model "E-250"

AMPLIFIERS *For Every Purpose*

HIGH output, rich tone, economical operation are the cardinal features of ELECTRAD AMPLIFIERS.

A famous *direct-coupled* circuit, greatly simplified and improved by ELECTRAD, is used.

Whatever your amplifier needs may be — for experimental purposes, radio reception, or public-address use, one of the four ELECTRAD models, *delivering from 1.6 watts to 21.9 watts of undistorted power,* will more than meet all requirements.

Write Dept. Q-1 for Complete, New Catalog

175 Varick St. New York, N.Y.
ELECTRAD INC.

When you see insulators like these . . .

No. 60

you'll know it's a JOHNSON idea

No. 20

They are good—we admit it. And anything good enough to be so widely copied is good enough for you to demand the original. If your jobber hasn't them—won't get them—order direct. Prices are right.

Depend on JOHNSON
for quality, prompt shipments, fair prices

E. F. Johnson Co., Waseca, Minn.

Get Started in. RADIO

Write for free booklet telling about this growing and most promising industry. The radio operator is an officer aboard ship. His work is light, pleasant and interesting. He has many opportunities to travel to all parts of the world. You can qualify in a short time in our well-equipped school under expert instructors.

Educational Department

WEST SIDE **Y M C A** 4 West 63d St. New York

It Cost us

$14,000.00

to produce—
and it's yours for

$1.00

POSTPAID ANYWHERE

SEE THE BACK COVER

A.R.R.L.
38 LaSalle Rd., West Hartford, Conn.

Here's my dollar. Send me mine.

..... (Name)

..... (Street or Box)

..... (City and State)

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.
(3) The Ham-Ad rate is 15c per word, except as noted in paragraph (6) below.
(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.
(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.
(6) A special rate of 7c per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7c rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and takes the 15c rate. Provisions of paragraph (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

PLATE power for your set, the very heart of its performance, for quietness, DX ability, lifelong permanence, absolute dependability, lowest ultimate cost, no other plate source even approaches the achievement of an Edison steel alkaline storage B battery. Built painstakingly; every joint pure nickel, upset electrically welded. Genuine Edison Electrolyte. Our list describes complete batteries, construction parts, enameled aerial wire, silicon steel. Available immediately, filament and plate transformers for the new 872–866 rectifiers, complete plate power units. Rectifier Engineering Service, 4837 Rockwood Road, Cleveland, Ohio.

OVER six pounds radio data, circuits, bulletins, 50c postpaid. Beyond Rockies, 75c. Kladag, Kent, Ohio.

1000 watt transformers, 1100–2200–4400 volts each side center on marble base, oilless. Guaranteed. Dawson, 5740 Woodrow, Detroit, Mich. $13.50. Twelve left.

FOR phone—special power pack, 500 volts pure d.c. and 7½ a.c. filaments. Special at $15. Request bulletin. General Eng. Corp., Charlotte, Mich.

QSLs! QSLs! Latest and most beautiful designs! Samples on request. W8DED, Holland, Mich.

GENERAL Electric 24/1500 volt 350 watt Dynamotors $37.50 24/750 volt 150 watt with filter condenser $25. For external drive $3.00 additional. Westinghouse 27½/350 volt .08 amperes $10. Mounted twins $15. 500 cycle watt aircraft generators Special $7.50. 900 cycle 200 watts $12.50. Henry Kienzle 501 East 84th Street New York.

WANTED—copies of old radio magazines, particularly *QST*, the Modulator, Amateur Radio and Modern Radio. Write and quote prices wanted. Jacques Kurtz, 1715 Caton Ave., Brooklyn, N. Y.

CRYSTALS: 80 or 160 meter band. Inch square, $2.50. ¾ inch, special $1.75. Blanks: Oscillating $1.75. Reference side finished $1.50. Rough cut, $.75. Fully guaranteed. John and Mark White, Ex-W7ALW Peru, Ill.

QSL cards, message blanks, stationery, snappy service. Samples free. Write today. W1BEF, 16 Stockbridge Ave., Lowell, Mass.

DYNATRON: Micrometric dial, Weston meter, General Radio condenser, cabinet and bakelite panel, $10. Write for details. W9CDA, Danville, Ky.

ON approval—almost new, standard W.E. watercooled tube, 5 KW, type 228A, used only 70 hours, $50; Morrill 4 mfd. 1500 working condenser, $5; Tobe 4 mfd. surgeproof 1300 volt condenser, $4; GE mercury arc, $5; New 211E, $4, Raytheon Kino lamp, $2; National precision "N" dial, $3; Weston Bakelite 0–3 ac. volts, $4; 0–300 ac. volts, $4.50; type 280, 0–500 mil dc., $4.50; W1AXD, 1751 Mass. Ave., Cambridge, Mass.

TRANSFORMERS Any type built to your specifications. We specialize in impedance matching transformers for public address work. Pair class B transformers for 46's $4.50. For 210's $5.50. For 203A's $9.50. 30H 300 m. a. Chokes $4.00. 6H 300 m. a. $2.75. All prices are postpaid. First grade material used, and unconditional guarantee on all work. We repair and rebuild any make of transformer. Write for free price list. Universal Coil Company, W6BYB, 305 33rd St. Sacramento, California.

GE power transformers for fifty watters, $5. Ernest Ruland, Natick, Mass.

MICROPHONE and meter repairs. Low prices. Quick Service. Sound Engineering Corp., 416 N. Leavitt St., Chicago.

TUBES repaired, any 1/4 kw., $35; a perfect job. Same characteristics retained. New UV204A types for sale, $40. W2AWZ, Irvington-on-Hudson, New York.

COMPLETE 15 watt Hartley $30, 30 watt P.P. TNT $35. With PDC power. W9DRG, Owatonna, Minn.

SALE or trade for radio parts. Complete Bell and Howell 16mm motion picture outfit including Kodacolor. Excellent condition, cost around $600. Will consider around 50%. W4OC, F. M. Whitaker, Durham, N. C.

TRANSFORMERS, 225 watt, 1000–1500–2000 c.t., $6.50; 450 watt 1500–2000–3000 c.t. $8.25; 600 watt 2000–3000–4400 c.t. $11; 2.5V 10 amp. c.t., $2.80; 10V 7 amp. c.t., $3.75. Polyphase, 25 cycle transformers. W9CES, Frank Greben, 2012 S. Peoria St., (Phone Canal 6364) Chicago, Ill.

LETTERS answered. Sell, trade, new; cheap. 204A, National 3 revr, large G.E. sunlamp, 1000 watt lite plant, Lockwood chief motor, cinderalla washer, 150 foot lead covered 2 conductor No. 12 cable, addressograph, Electric exerciser, Lewis humidifier. Write W. Ryder Jr Hibbing Minnesota. W9CIY.

QSLs. Get our samples and prices before ordering. Maleco, 1512 Eastern Parkway, Brooklyn, N. Y.

RADIOPHONE transmitters, complete with power supply, $19.75. "Sparks," Skowhegan, Maine.

ONLY $2.00! Model "Y" Experimenters' super-sensitive, midget single-button microphone. Unquestioned Universal quality performance. 200 ohms. Pure Gold Spot Center Diaphragm. Price includes general catalog with diagrams. Universal Microphone Co., Ltd, Inglewood, Calif.

CODE machines, tapes and complete instruction for beginners or advanced students—both codes—for sale or rent, very reasonable. Rental may apply on purchase of new equipment. Special offer to Amateurs. Extra tapes for all machines. Instructograph, Dept. Q, 912 Lakeside Place, Chicago.

SELL new SW-3 National receiver with coils, power pact, and phones, $25. Jack Schaefer, 550 Maccabees Bldg., Detroit.

BRAND new Vibroplexes, $12. Rebuilts, $9. Guaranteed. Frank Lydeard, 28 Circuit, Roxbury, Mass.

TRANSFORMERS rewound or built to order, speaker field coils all types, graphite volume controls rebuilt. Guaranteed as new, 8 hour service. Pembleton Laboratories, 921 Parkview, Fort Wayne, Indiana.

CRYSTALS: Your approximate frequency, 80 and 160 meters, $1.35 prepaid. Excellent oscillators. Selected highest grade Brazilian quartz one inch blanks 65¢. Irregular shapes 25¢. Standard dust-proof plug-in holders 75¢. Fisher Laboratory, 1200 E. Nevada St., El Paso, Texas.

IMMEDIATE shipment: SW3s $20.88, SW58s $40.88, AGS $165; Comet Pro $79.38; Power crystals $4, holders $1.50; 866s $1.95; Speed-X bug $7.50; Vibroplexes $15.30; No. 12 enamelled wire 5¢ a ft.; 20" porcelain insulators 75¢; porcelain Zepp feeder spacers 25¢; any other new apparatus. List. Write. Henry's Radio Shop, Butler, Mo.

CRYSTALS—Brazilian Quartz, c.o.d. Complete practical instructions on grinding and calibrating crystals, including circuits and thickness chart 75c—Calibrated crystals, 1" X or Y, 1750 to 4000 k.c. $3.50—Oscillating blanks, 1" $1.50—Unfinished blanks, 1" $1—Blanks, odds and ends 60c—Carborundum, coarse or fine, 25c per box—Dust-proof plug-in holders, $2.25. William Threm—W8FN, 68 East McMicken Ave., Cincinnati, Ohio.

OMNIGRAPHS, Teleplexes, transmitters, tubes, receivers, Vibroplexes, meters. Bought, sold, traded. Ryan Radio Co., Hannibal, Mo.

VOLOVOX dynamic microphones give "broadcast quality". $7.75 postpaid in U.S. Specify field resistance. Baker Engineering Laboratories, Fort Wayne, Indiana.

TRANSFORMERS, reactors made to order. Accurate, dependable. Prompt shipments. Write for quotations. Baker Engineering Laboratories, Fort Wayne, Indiana.

SELL—National SW5, a.c. with power supply, tubes, coils 15 to 200 meters and band spread 20 and 80, excellent condition, thirty-five dollars, cash. C. C. Smith, 77 Spencer Ave., Lancaster, Pa.

CRYSTALS: Finest grade, accuracy 0.1%, X or Y cut; 80, 160 meters $4.00; 40 meters $7.50; unconditionally guaranteed. Inquiries invited. Crystal Grinders, Ramsey, N. J.

NATIONAL ACSW5, five bands complete except for speaker, $35. 3 band push-pull xmitter complete, $20. 3 band TNT xmitter complete, $15. Write Joe Tucker, 715 East 4th St., Brooklyn, N. Y.

MOST beautiful QSLs in America! Samples for stamp. T. Vachovetz, Elmsford, N. Y.

QSL cards, new styles, two colors, 85¢ per hundred. Free samples. W8DTY, 257 Parker Ave., Buffalo.

SELL: W2AEW's 4 tube a.c. receiver, $15, and 3 tube a.c. receiver, $10. Also station surplus, crystals, condensers, etc. Write for details. 77 Cuthbert St., Scotia, N. Y.

QSLs, printed to order. Lowest prices, highest quality. Samples on request. W2AEY, 338 Elmora Ave., Elizabeth, N. J.

QSLs, two colors. 100—70¢, 160—$1. W6ATG.

SALE or trade—300 volts Edison "B" battery knocked down; one used Omnigraph: one used Bug. A. Goldinger, Woodbine, N. J.

Erkentenis van heti n *QST* gesien te hebben identifieert U en ondersteunt *QST*

QSLs, 100 one color, 50¢, two colors, 80¢. Samples, 2143 Indiana Ave., Columbus, Ohio.

CRYSTALS: 465–4000 kilocycles Smith-precision power, $2. Frequency 0.05%. Guaranteed. W6BCX.

QSL cards, message card, wall cards, stationery. Hillcrest, Cranesville, Pa.

SELL surplus parts, receivers, etc. Stamp for list. W8DLB, Algonac, Mich.

DOLLAR buys 150 two color QSLs, 75¢; 100 postpaid. Samples. W9GOF, Mishawaka, Ind.

QSLs, 90¢ per 100 two colors. W9DGH, 1816 5th Ave., N., Minneapolis, Minn.

CONFERENCE widens bands? No! But widen them yourself with our distinctly better audio band-pass filter — $5.85. Card brings dope. George Carson, Iowa City, Ia.

QSL cards — a new kind. Have you seen them? Regulars, two color 70¢ per 100 up. Free samples. W1DNF, 631 Whittenton St., Taunton, Mass.

QUARTZ — make your own oscillating crystals. Write for full details. Direct importers from Brazil of best quality pure quartz suitable for making piezoelectric crystals. Diamond Drill Carbon Co., 720 World Building, New York.

FREE plugin, dustproof holder with every amateur band crystal purchased this month. $2.25 value. Power crystals. X cut, 1" square carefully ground to within 0.1% of your specified frequency. 1750 and 3500 kc. bands — $4.50. Special: 7000 kc. band $5.50. (Your approximate frequency. Calibration 0.1%) Plugin, dustproof holders — $2.25. Ovens and precision crystals quoted on request. Heavy duty 866's — $2.25, 15 watt 210's — $1.50. Fifty watt sockets — $1. Above postpaid in U. S. and Canada. Precision Piezo Service, 427 Asia St., Baton Rouge, La.

QSLs — SWLs — stationery. W3BHG, 3536 Roland Ave., Baltimore.

TRANSMITTING and receiving equipment manufactured to order. Holmes C. Miller, Radio Engineer, Box 105, Palo Alto, California.

$40 relay racks, $6.50. That prized commercial look. See other hamad. Rectifier Engineering Service.

WILL exchange 160 and 80 meter crystals for tubes, meters and transmitting condensers. W8FN, 4021 Davis Ave., Cheviot, Ohio.

QSL bargain: 150 two-color, government stamped cards: and your name-call rubber stamp, $3. Doc Miller, W9KYD, Ashland, Nebr.

CRYSTALS: X cut, 1" or 1/16" sq., accurate and neatly finished, $3. Dustproof plug-in holders, $1.50. Crystal and holder, $4. Osc. blanks, $1. Compound, two grades for 25¢. W8DLM, Rochester, Mich.

PY quartz: Blanks either cut, approximately 1" square, $1. W9ALZ.

QSLs. W8DDS, Cleveland.

WILL trade low power equipment for tenor guitar. Harold Krull, 24 Forest St., Bull's Head, Staten Island, N. Y.

QUALITY condenser microphone head $9.90. Public address head $15. Broadcast $24. Power crystals with bakelite plug-in holder $2.95. Crystal oven thermostats $2.50 complete. Pioneer Radio Engineering Company, 5166 West Pico, Los Angeles.

BRAZILIAN quartz, x or y cut finished crystals, 1715 to 4000 kc. Guaranteed. C.O.D. $2.50. Scheufler Radio Service, Sandusky, Ohio.

SENSITIVE but sturdy. Single button mikes mounted in black, nickel trimmed, stands. Dress up your phone station. Well known make. Best value ever. $1.00 each postpaid while they last. Two way telephone kits, quality parts. Good, "shack" to house etc. $1.69. Keen relays, filter condensers, wire, other salvage equipment. Bargain bulletin, stamp. Engineering Service Company, 1718A South 14th Street, Lincoln, Nebr.

SELL or trade high quality input, output transformers for meters. Walter Lehnert, Blakeley, Minn.

SELL, trade: WE387W mikes $17.50, WE394W $27, WE212Ds $24; Deforest 552s $9, 560s $12; transmitting tubes; receivers; meters; MGs; Omnigraphs; other apparatus. W9ARA, Butler, Mo.

QSLs. W8AKY, 2857 Ambler, Cleveland, Ohio.

"B" eliminator, $1.95. Fine for short wave receiver. No hum. Robert Snyder, Richmond, Indiana.

QSL the 4most way—three distinct features. Handy, practical, systematic. Hams now recognize these advantages. Our Club Printing Plan will save real money for your organization. Let us show you. Drawer E, Camden, New York.

SELL or trade: 2 RCA 845s with new Leeds sockets, $25. Want Jewell 444 analyser; WE212D socket; Jewell or Weston radio frequency meters, 0-5 amperes, and 33 mm. projector. W1CDT, Meredith, N. H.

CRYSTAL blanks: X or Y cut (finished) one inch square or larger guaranteed. $1.50 postpaid. Information on finished crystals upon request. Bellefonte Radio Engineering Lab., Bellefonte, Pa.

MONITORS — Calibrated band spread 20, 40, 80 meter coils, with tube, batteries $7.75. Three tube receivers (metal cabinets) band spread, screen grid detector, using newest tubes. AC-DC models $12.75. All parts for *QST* superheterodyne receiver. We build to order. Write for quotations. Precision Radio Laboratories. Dept. 7C, 307 West 79 Street, NYC.

QSLs. Designed by QST's cartoonist. Real "Hammy". Samples. Box 119, West Hartford.

MIDGET meter rectifiers. Full wave bridge, $1. W8FJP, Ada, Ohio.

SELL — transmitting tubes and accessories; new and used. List, 300 items. Howard, 5508 Fulton St., Chicago.

203As brand new, late model, Westinghouse or GE $12.00. Class B transformers pair 210–$7.00; for 203As–$10.00. 10,000V heavy duty 866s–$3.00. c.t. 866 fil. transformers $2.50. New RCA UX 250s–$1.75. Weston type 301 milliammeters $3.75 (some new, all new condition, most all ranges) 204As, 860s, 212Ds, water cooled tubes, etc. Beginners Candler course with complete equipment $18.00. List. E. Ewing, Jr., 1057 Pratt Blvd., Chicago.

GUARANTEED crystals near specified frequency, $1.35. Plug-in holders, $1.10. Prepaid. Ed. Hlavaty, 516 Northwestern, W. Lafayette, Ind.

TRANSFORMERS — 46s, class B, $4.50 pair. 203As, class B, $9.95 pair. Plate filament and audio transformers and chokes. Write for circular. Earl Anderson, W8UD, Douglas, Mich.

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50c. straight with copy in following address form only:

W2EOI — Prospect Park "Y" Radio Club, 357 Ninth St., Brooklyn, N. Y.

W1MK, A.R.R.L. Headquarters

R. B. Parmenter, Chief Op "rp"

The following calls and personal sines belong to members of the A.R.R.L. Headquarters gang:

W1AKW-W1KP Clyde J. Houldson "ch."
W1BAW R. T. Beaudin "rb."
W1BDI F. E. Handy "fh."
W1CBD-W9ZZF Clinton B. DeSoto "dc."
W1AL J. J. Lamb "jim."
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W1EH K. B. Warner "ken."
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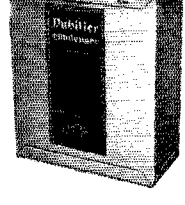
W1RP R. B. Parmenter "rp."
W1SZ-W1BIZ C. C. Rodimon "rod."
W1EU E. L. Battey "ev."

Transmitting Condensers



Dubilier brand means all types—mica, paper, oil-filled, oil-impregnated, ultra-short-wave, and now, compact electrolytics here shown. Infinitely superior workmanship and materials. Two-year service guarantee. Lowest prices.

Write for data on Dubilier transmitting condensers as well as other types in which you are interested.

DUBILIER CONDENSER CORP.
4377 Bronx Blvd. New York City

To Our Readers who are not A.R.R.L. members

YOU *should* become a member of the League! That you are interested in amateur radio is shown by your reading of *QST*. From it you have gained a knowledge of the nature of the League and what it does, and you have read its purposes as set forth on the page opposite the editorial page of this issue. We should like to have you become a full-fledged member and add your strength to ours in the things we are undertaking for Amateur Radio. You will have *QST* delivered at your door each month. A convenient application form is printed below — clip it out and mail it today.

A bona fide interest in amateur radio is the only essential qualification for membership

AMERICAN RADIO RELAY LEAGUE
West Hartford, Conn., U. S. A.

I hereby apply for membership in the American Radio Relay League, and enclose $2.50 ($3.00 outside of the United States and its Possessions, and Canada) in payment of one year's dues, $1.25 of which is for a subscription to *QST* for the same period. Please begin my subscription with the.....issue. Mail my Certificate of Membership and send *QST* to the following name and address.

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Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may send him a sample copy of *QST*?

.....

Thanks

For Your Convenience
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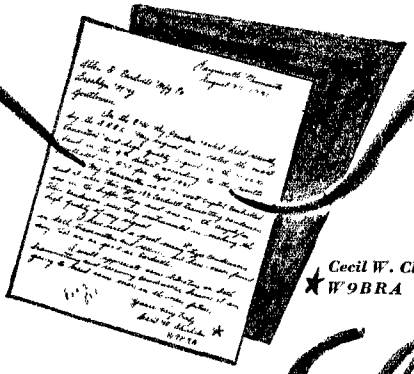
My transmitter is a 75 Watt crystal controlled, and uses two type T-183 Cardwell Transmitting Condensers, one in the buffer stage and...



In the C.W. key pounders contest held recently... my signal was rated the most consistent and high quality signal in the 3500 Kc. band in the 9th district...

Cecil W. Chisholm
W9BRA

Cause and Effect

OR

"NO SMOKE WITHOUT FIRE!"

"High quality" and "consistent" signals require high quality and consistent condensers. W9BRA *might* have attained the same degree of success with other than CARDWELL condensers but with the odds always in favor of the best equipment, why use anything else?

For many years CARDWELL condensers have more than held their own against countless "improved" designs and "world beating" innovations. CARDWELLS are better because they are *fundamentally* right and fundamentals, somehow, manage to remain essential factors not subject to change at the will of *any* designer.

Just as there is no smoke without fire, so must there be a reason for sincere and entirely unsolicited letters of commendation like W9BRA's, continually being written to us by enthusiastic Amateurs everywhere.

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Fundamentally **right. A CARDWELL 20000 volt transmitting condenser and a small receiving condenser.**

Note how consistently and successfully the CARDWELL construction design—the Standard of Comparison for more than a decade—is employed in condensers for harnessing tremendous potentials or for tuning the smallest receiver or transmitter.

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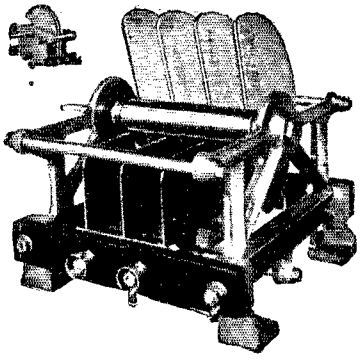
Big condensers for high powered transmitters. Smaller ones in infinite variety for every tube and purpose. See the CARDWELL Midway Featherweight, made for both transmitting, and receiving, and particularly useful for aircraft and portable equipment and neutralizing purposes. Only a handful, all aluminum and featherlight—but a man's condenser that will hold its own anywhere. *Send for literature.*



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Any reliable supplier should cooperate with you to enable you to get what you want. He can get CARDWELLS for you if he does not keep them in stock. Get what you want—insist on CARDWELLS. Order direct from us if your dealer will not supply or let us tell you where you may buy.

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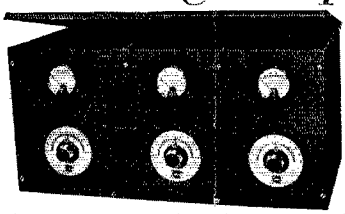
Startling low prices for Sterling Equipment!!



The Famous GC-30 Crystal Control Transmitter

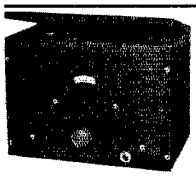
Now a greater value than ever — HOYT METERS — GERMAN SILVER DIALS — BAKELITE INDICATOR KNOBS and other refinements at no increase in price.

Your choice of 210 oscillator 210 buffer 210 amplifier or Pentode oscillator 210 buffer 210 amplifier. Can also be supplied with two-210's in push pull in output stage. Completely assembled ready for you to wire with three Hoyt meters, **$29.50**; with three Weston meters, **$42.50**; 210's push pull in output stage **$8.00** extra.

CLASS "B" MODULATION UNITS — for modulating the GC-30 complete kit.....**$39.50**

RELAY RACKS — fine for mounting the GC-30 or GC-100 and all power packs. Black crystalized finish, price.....**$12.50**

GC-100 — Same construction as GC-30 — a new higher powered job for use with 203-A or 211 in the output stage. Completely assembled.....**$39.50**

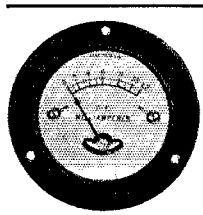


MONITOR USES FULL SIZE DRY CELLS

A real advantage for continuous monitoring. Again Jerry must say this is SOME job. Has back of panel vernier dial shielded in black crystalline finish cabinet with hinged cover, complete with three plug-in coils for 20, 40 and 80 meters, all batteries and tube, wired and tested.....**$9.95**

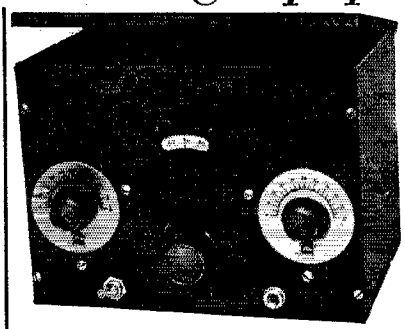
FIVE METER RECEIVER — A REAL receiver, built in same cabinet as the Eagle, with two German Silver dial plates and fine action vernier dial. The quality of this set is above any offered — Jerry invites comparison — custom made construction — a fine job. Uses 2-237's and 1-238 tube. Employs *QST* super regenerative circuit. Completely assembled.....**$12.50**
Completely wired and tested.....**$16.50**

FIVE METER TRANSMITTER — Matched in appearance with the receiver, slightly longer cabinet supplied with two Hoyt milliammeters — Heising modulation — employs 2-245's and 2-247's — can also be used with 210's as oscillators and 250's as modulators by using one external stage of audio. Completely assembled.....**$17.50**
Completely wired and tested.....**$22.50**



HOYT ANTENNA METERS!!!

Hot wire antenna meters 1½, 3 and 5 ampere ranges. Why do without antenna meters when you can buy them at Jerry's who knows what the "Ham" wants? Special low price.....**$2.95** each Hoyt perfectly damped meters at a price. These are not to be confused with the usual meter "bargains." 2" mounting hole, flange 2½" diameter, supplied in the following sizes: 10 m.a., 50 m.a., 100 m.a., 150 m.a., 250 m.a., 300 m.a., 4 volt A.C., 10 volt A.C., 15 volt A.C., 10 volt D.C. Price each.....**$1.60**
three for.....**$4.50**



The "Eagle" a new sensational 3 tube S. W. Receiver

$16.95

Here at last is a short wave receiver embodying features comparable to those in sets selling at a much higher price. Unusually flexible, designed for continuous short wave broadcast coverage or ham band spreading. Constructed of finest material available, such as Hammarlund Isolantite Insulated Condensers, etc.

This Receiver was designed for the discriminate buyer desirous of purchasing the finest short wave receiver of its kind, and should not be compared with any of the "junk piles" selling at anywheres near the price of the "EAGLE."

The "EAGLE" is guaranteed to give you the satisfactory performance you would naturally expect from apparatus produced by JERRY GROSS.

Economical to operate. Employs the new 2 volt tubes which can be operated from two dry cells on the filaments for extended periods of time.

Altho the "EAGLE" is the ideal amateur receiver incorporating such features as full band spread, etc., it is not limited to this purpose alone, but is also an unusually efficient short wave broadcast or police alarm receiver. While full dial coverage on each ham band can be had, the "EAGLE" may be adjusted to cover continuous range from approximately 15 to 200 meters. This is very easily done by controlling the tank condenser which is operated from the front of the panel.

CHECK THESE FEATURES!!

SCREEN GRID 232 R.F. and screen grid detector offering highest possible gain and most efficient regeneration.

PENTODE POWER AUDIO — 233 gives more audio gain than obtained from two ordinary transformer coupled stages. Will operate speaker on most stations.

TANK CONDENSER — is operated from the front of panel and eliminates the objectionable necessity of lifting the cover. Speedy range changes at your finger tips. The ADDITIONAL condenser employed here gives much finer tuning than is possible with the ordinary large condenser.

BAND SPREADING CONDENSER — very small capacity permits widest possible calibration spread over a multitude of ranges. This feature gives you really two receivers for the price of one.

DIAL — Latest design, real vernier control over any position of the frequencies covered. Absolutely will not jump or slip — very rugged.

REGENERATION CONTROL — Employs condenser for stability, ruggedness and velvet-like smoothness, not noisy like resistances.

POWER CABLE — Eliminates possibility of wrong connections and insures absolute electrical contact.

CABINET — Size 6" x 7" x 9½", metal, compact, hinged cover, crystalized finish. Completely shields the receiver. Also ideal for portable use.

RANGE 15 to 200 meters — 4 plug-in coils are supplied with each receiver.

The "EAGLE" completely wired and tested. Price.....**$16.95**
The "EAGLE" complete kit of parts with diagram. Price...**$12.95**

COMPLETE STOCK OF NATIONAL — HAMMARLUND — CARDWELL — JEWELL — WESTON and other standard lines always in stock — write for prices

PRICES CUT

Plated copper tubing inductances wound and ends drilled free

Inside dia.	3/16"	¼"	5/16"
1½"	5c turn	5c turn	
2½"	6c turn	6c turn	10c turn
3½"	10c turn	10c turn	12c turn

ALUMINUM

Cut to size specified

1/16" thick per sq. inch.....7/10c
3/32" thick per sq. inch.....3/4c
⅛" thick per sq. inch..... 1c
Beautiful plug-in crystal holders....**$1.15**
(limited quantity)

Bliley superior crystals exclusive in New York with Jerry's — 40, 80 or 160 meter guaranteed crystals.....**$5.50**
They must be good — otherwise Jerry would not sell them.
Bliley plug-in moulded bakelite crystal holders, polished chromium electrodes **$1.50**

ACME SOLID ENAMELED COPPER ANTENNA WIRE

No. 14 (any length) per 100 ft.....**$ .30**
No. 12 (any length) per 100 ft.....**$ .45**
No. 10 (any length) per 100 ft.....**$ .80**
No. 8 (any length) per 100 ft.....**$1.20**

High grade filament transformers shielded in metal cases, center tapped secondaries
2.5 volt 10 amperes for 866's
10 to 12 volts at 8 amperes — either type.....**$2.50**
Special — 10 to 12 volt 7.5 amp. filament transformer extra special.....**$.95**

No. 10 stranded Tinned Antenna wire strong and extremely flexible only **$.85** per 100 ft. (Any length.)
Na-Ald S.W. coils 20-200 meters, set of four.....**$1.15**
Glazed beehive stand off insulators, **$ .07**
Guaranteed 210 tubes.....**$1.40**
DeForest 450 tubes, spec.....**$1.95**

20% deposit with all C. O. D. orders. Include Postage.

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"JERRY'S PLACE"

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Gross RADIO

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CONCORD, N. H.

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To Run Your Station the Way it Should be Run

OFFICIAL A.R.R.L. MESSAGE BLANKS — The proper and most convenient form. Designed by the A.R.R.L. Communications Department to make speedy and accurate handling easy. A great aid to good operating practices which reflect credit on your station. Bond paper, size 8½ x 7¼. Put up in pads of 100 sheets. *One pad 35c or three pads for $1.00. Postpaid.*

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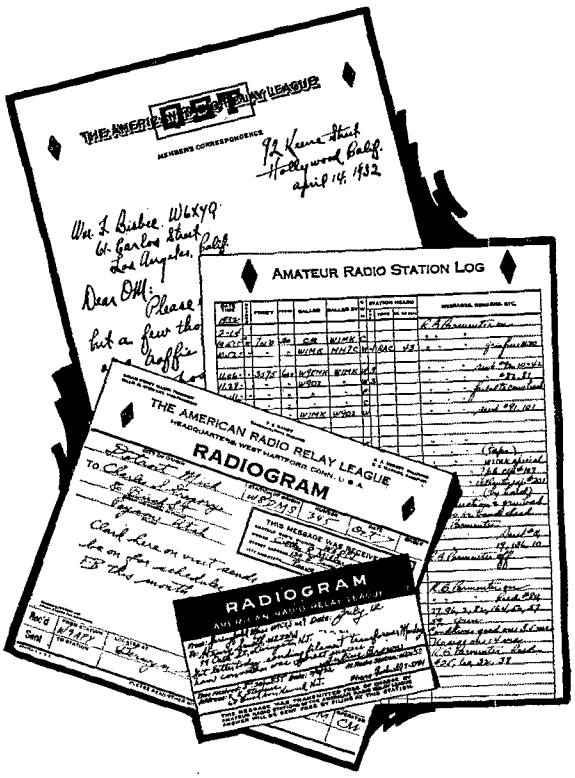
Write your radio letters on this A.R.R.L. stationery. It identifies you. Used by most old-timers and prominent amateurs. Excellently lithographed on 8½ x 11 bond paper. Now using heavier 20-lb. stock instead of 16-lb. as heretofore. *100 sheets — 50c; 250 sheets — $1.00; 500 sheets — $1.75. Postpaid.*



OFFICIAL A.R.R.L. LOG BOOK A well-kept log is an essential part of a well-run station. This book, with 39 pages for operating records and 39 blank pages for miscellaneous notes, forms a complete history of your station — your most valuable radio record. Contains list of Q signals, message number sheet, bound-in page of cross section paper for receiver or frequency meter calibration, etc. Size 8½ x 10¾, bond paper, bound in heavy paper covers. *One book 40c or three books for $1.00. Postpaid.*

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West Hartford, Connecticut

The Big News in Amateur Radio

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